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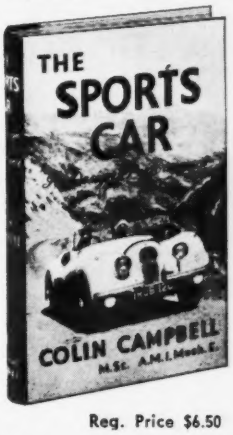

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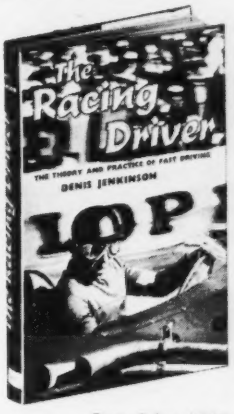

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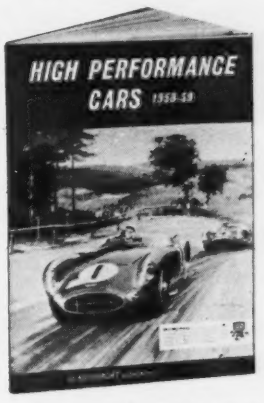

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SPORTS CARS ILLUSTRATED

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november 1959

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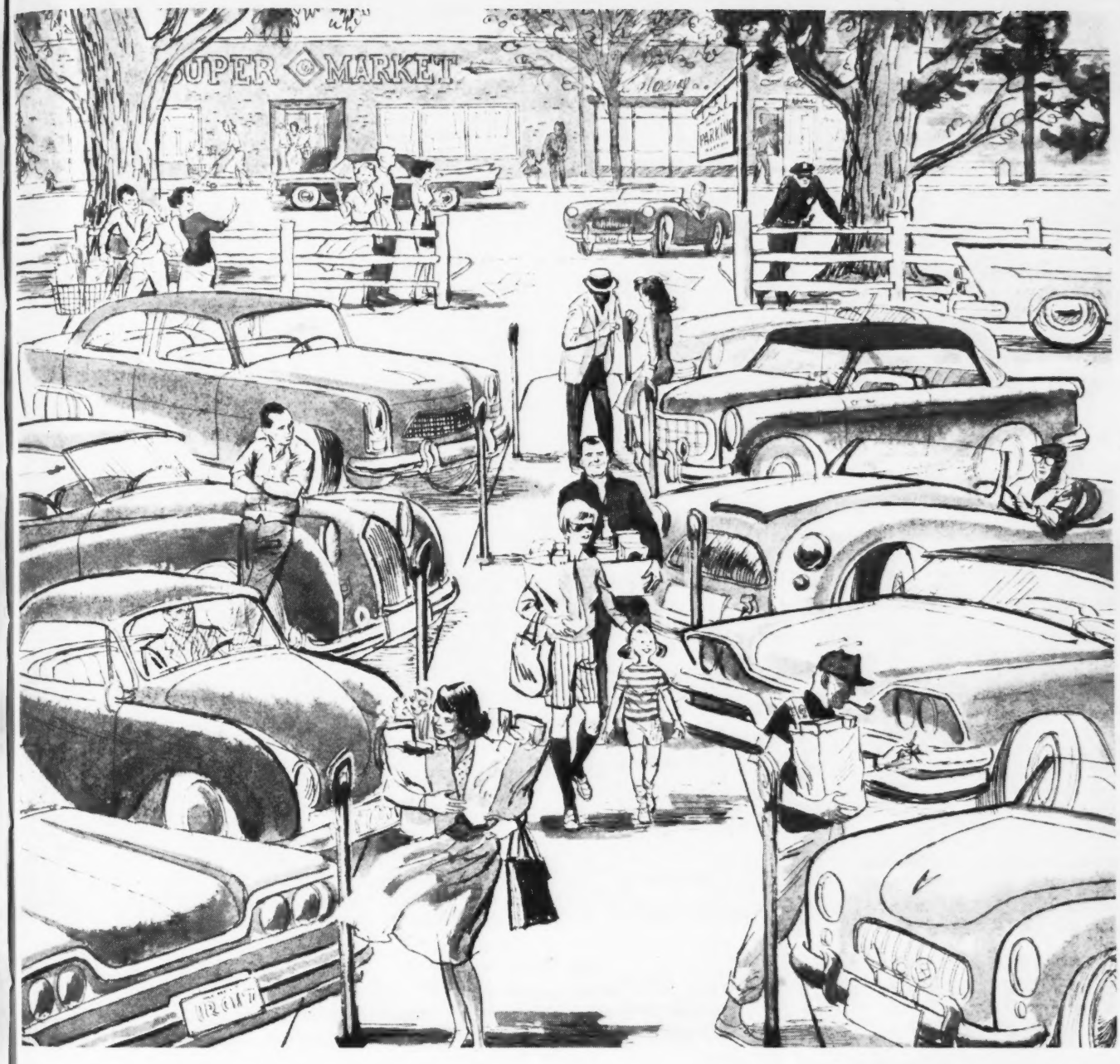

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OBSERVATION AND OPINION

► As more and more new models are unveiled, the year 1960 can be seen as the most exciting as well as the most important year in the automotive field since the war. It's now possible to view more clearly the astonishing parallel between developments in America and in Europe. On both sides of the Atlantic leading automobile constructors are introducing radical new models spaced just one notch in size and cost below their existing lines: the Corvair, Falcon and Valiant here and the Austin Seven and Morris Mini-Minor in England. Under the competitive pressure of the European Common Market, car design on the continent tends subtly toward a mean, while insistent demands for specialized vehicles are driving U.S. constructors toward extremes.

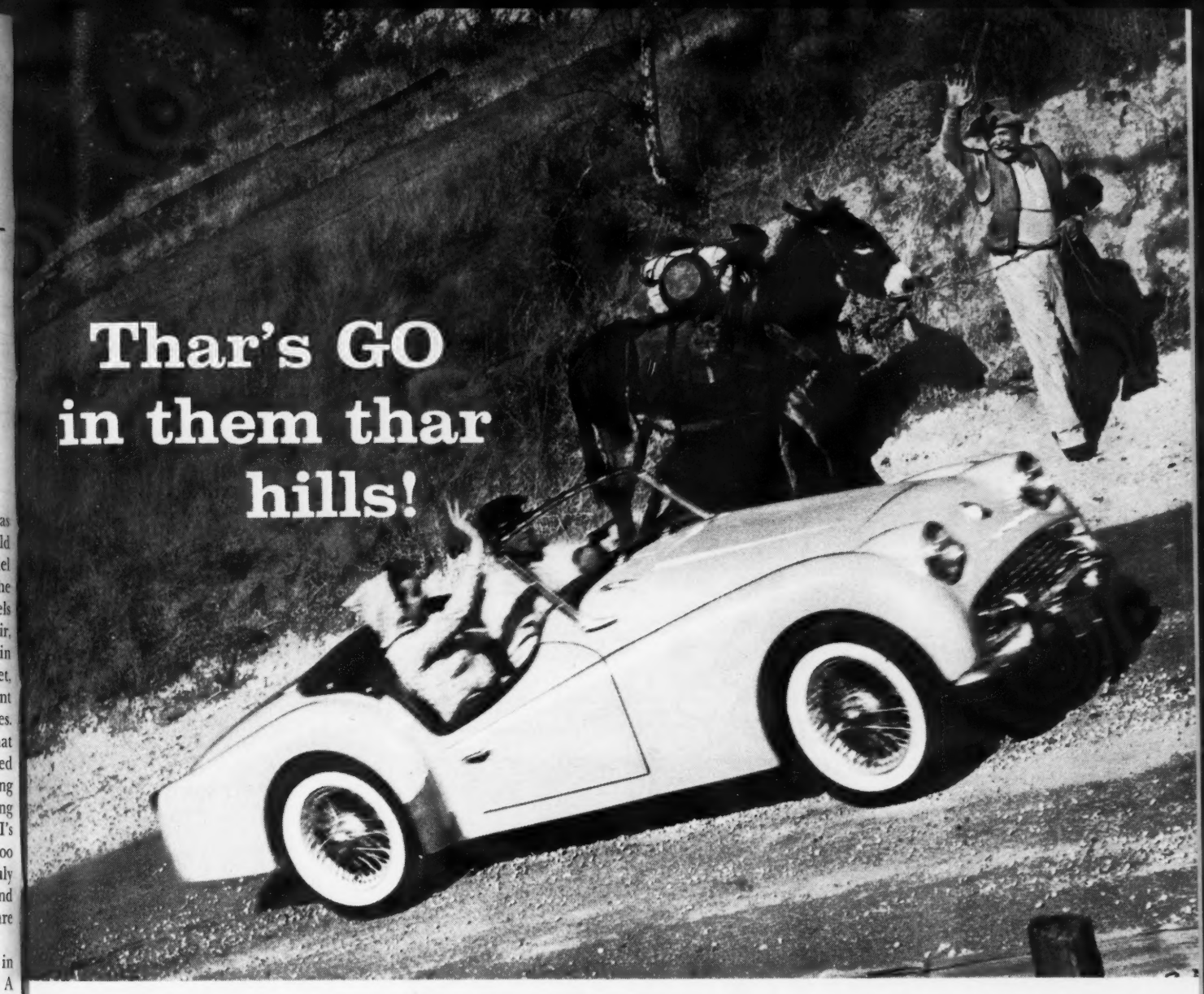
So important are these new models and so numerous that SCI feels that evaluation and judgement of them must be made in an unusually considered manner. We have always felt that road tests carried out on company proving grounds are acceptable only under very unusual circumstances, it not being possible to obtain an accurate or thorough impression of the car without SCI's own testing equipment and special test areas. The cars involved are also too likely to be prototypes or early production examples that are not truly representative of the make and model. We respect Detroit's initiative and courage in introducing the new breed of compact cars, and in return are determined to judge these cars in unusual depth.

This month the development and design of the Corvair are analyzed in detail, and those driving impressions appended that we felt were justified. A preliminary evaluation of the Falcon is also presented in road test form. In December the whole exciting Chrysler Valiant story will be presented by Mike Davis from Detroit. When – and only when – these cars are in production and on the road, with a service record and owner reaction to back them up, SCI will weld this firm data into comprehensive reports on their utility and performance. To attempt this now would be premature.

Also in this issue is a profile in the grand manner of the new star in the Mercedes-Benz firmament, secured through the co-operation of H. U. Wieselmann of the *Vereinigte Motor-Verlage* in Stuttgart. In his bi-weekly DAS AUTO, Uli Wieselmann discussed penetratingly his native German Grand Prix – reported on in full by Jesse Alexander in this issue. His final judgement on the Avus contretemps ran as follows: "As sorry as it makes me feel for the sports-crazy Berliners, this Avus adventure should not and dare not be repeated. According to today's concepts the Avus is no longer a race track, and only a complete lack of appreciation of the facts could have marked it as a Grand Prix course. The lesson was bought dearly, all too dearly." As already suggested in some quarters, the delightful Solitude circuit near Stuttgart could solve the AvD's financial problems without degrading Grand Prix racing and sacrificing more drivers' lives.

A failure to process a correction for last month's issue led to the startling statement in *Racing Brakes* that Ted Halibrand makes his disc brake calipers out of cast iron. One of the pioneers in the application of magnesium for racing, Ted obviously chose this material for his brake cylinder housing, thereby enhancing its ability to dissipate heat. Brakes, by the way, continue to be in the news as Pontiac announces the optional availability of an aluminum integral wheel/brake drum assembly for its 1960 models. Al-Fin drums can now be had on Buick, Pontiac and Oldsmobile, marking new recognition of the pressing problem of braking on large American cars.

Karl E. Ludvigsen



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Those of you interested in the Triumph TR-3's less strenuous virtues will like the economy (count on up to 35 miles per gallon), the orthopedically designed seats and the *fun*. All of them are standard equipment.

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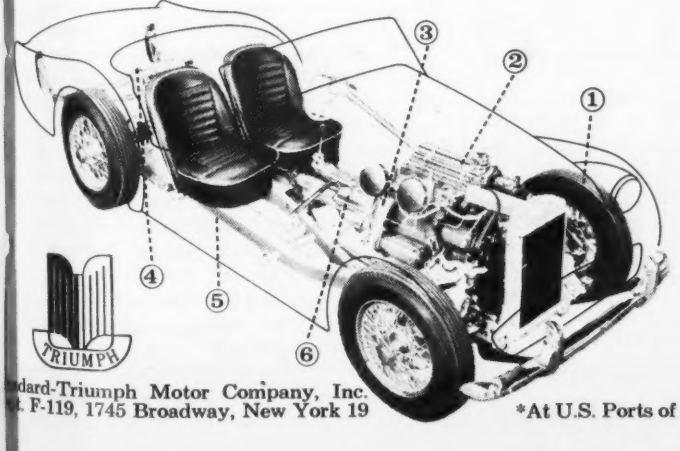

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LETTERS

NASH-HEALEY

I must inform you in behalf of our Association and Mr. Donald Healey, (if he hasn't already written to you) that there is a glaring and almost unforgivable mistake, in the story "Americans at Le Mans" by Hugh McGrillen.

Briggs Cunningham did place fourth in 1952, but it was not a 1, 2, 3, triumph for Mercedes. The Nash-Healey Number 10, (American powered, though I must admit, British driven) came in third over all and first in class, followed by Cunningham in fourth. Please remember that the Healey win was accomplished with a rather stock (in comparison to the other competitors) Nash Ambassador six cylinder engine producing only 145 H.P. What were Cunningham's Chrysler V-8s rated at, 300 plus H.P.? Also the Nash-Healey placings each year were consistently better than Cunningham's. 1950 had Nash-Healey *4th* and Cunningham crew *10th* with a Cadillac. 1951 had Nash-Healey *6th* and Cunningham *18th*. 1952, as I corrected, had Nash-Healey *3rd* and Cunningham *4th*. 1953 had Nash-Healey *11th* and Cunningham finally made the big time by also accomplishing a third place. Nash-Healey suspended competition in 1954 as Mr. Healey was concentrating his efforts on the new Austin-Healey.

In appeasement, how about doing a really detailed story on the relationship between Nash and the little Equipe from Warwick, "Healeycars Ltd.", who carried the ball for us at Le Mans, and tried so hard to put an American company in the winner's circle to share the laurels of the then best from Great Britain.

Nash-Healey Association of America
Kent C. Martin, President
127 W. 14th Ave.
Naperville, Illinois

FERRARI ROAD TEST

As the owner of a new Ferrari 250 GT Coupe I was particularly interested in the road tests and other data contained in your September issue. However I do think that, in fairness to this marque, some comments concerning your criticism of the steering and brakes are pertinent.

While obviously you can only run tests of cars made available to you, there is some question in my mind if the two cars tested are representative of what an ordinary owner can expect. Mr. Arents' Berlinetta, I understand, has seen a lot of road. The California, while it appears from your report to have low mileage, is owned by an under-age young man, used only as a dragster, and has been handled "brutally."

In the course of the last ten years, I have owned an M.G., two Jags, an Aston Martin, an Alfa 1900C Super Sprint, and a 300 SL Roadster. All of these sports cars were purchased new as was my 250 GT. Of these cars, only the Aston steered as lightly and positively as does the 250 GT and only the Alfa had brakes comparable to those on the 250 GT.

Duncan Hodges
Lake Forest, Illinois

NSU PRINZ

We are very grateful for the road test on the NSU Prinz in the August SCI. We would appreciate it if you would acquaint your readership with some of the facts below which they might find helpful.

1) The NSU Prinz has a *4-cycle* engine.
2) The NSU factory (NSU Werke A.G., Neckarsulm, West Germany) is in no way connected directly or indirectly with Fiat, and the Prinz was developed entirely on their own; nor is the NSU Prinz a take-off on a Fiat car. There existed some cooperation between Fiat and NSU which lasted from 1929 to 1932, and by ending this cooperation the assembling of Fiats was stopped (by NSU).
3) There is available the NSU Sport Prinz, body designed by Bertone, which is going into production now. It has a 36 HP 2-cylinder 4-cycle (regular gas) air-cooled aluminum rear engine. The same engine of the NSU Sport Prinz is also available in the NSU Prinz 30.
4) The picture of the NSU Prinz on top of page 42 shows the pivoted rear window which is an option; this being the only small car with excellent ventilation of the rear seats.

Fred R. Oppenheimer
President
Fadex Commercial Corp.

COMPETITION CLASSES

A fellow enthusiast and I are very much confused in regard to racing classes both national and international. Is it true that Formula I refers to sports cars of 3000 cc? We are also a bit confused about Formula II. We know that this is up to 1500 cc but does this refer to sports cars or open wheeled single seaters?

We can not figure out where Grand Prix cars fit in. Are these Formula I, or are they a separate classification? How about the alphabetical designations?

Any help we may receive to end this confusion will be greatly appreciated.

Robert E. Snauffer, Jr.
John J. Sabina, Jr.
Pittsburgh, Pennsylvania

Both Formula I and II refer to open wheeled Grand Prix cars. The displacement limits are 2500 cc and 1500 cc respectively. The alphabetical class designations pertain to sports cars and are broken down as follows:

SCCA NATIONAL CLASSES

CLASS	PRODUCTION		MODIFIED	
	over	under	over	under
A	5000	——	8000	——
B	3500	5000	5000	8000
C	2700	3500	3000	5000
D	2000	2700	2000	3000
E	1600	2000	1500	2000
F	1300	1600	1100	1500
G	1000	1300	750	1100
H	750	1000	500	750
I	500	750	350	500
J	350	500	——	350
K	——	350	——	——

The sports car classes as set forth in Appendix C of the F.I.A. rules governing international competition are the same as the Modified category in SCCA racing.

EUROPEAN NEWSLETTER

by Jesse L. Alexander

VW REFINEMENTS

► Detail improvements in the 1960 Volkswagen will include a safety-dished steering wheel, better formed seats, a footrest for the front passenger, new pushbutton doorlocks, and soundproof padding under the rear seat. This extra stuffing will also help keep out acid fumes from the battery located under the seat. With an eye toward improved roadholding all VWs in the future will be equipped with a front end roll bar now found only on the more sporting Karmann Ghia coupe. Still another change intended to improve handling is the tipping of the engine transmission unit two degrees down at the nose. This lowers the pivot point of the swing axles proves cornering characteristics. Both about ⅝-of-an-inch which in turn improves cornering characteristics. Both front and rear suspensions have also been made softer, and more progressive. A more powerful generator — 180 Watt instead of 160—"tropicproof" fan belt and padded sun visors round out the changes in the people's car for 1960.

The VW's pretty sister, the Karmann Ghia, has also undergone some minor face lifting. The front fender line has been raised, and the fresh air intakes in the nose enlarged. More important from the standpoint of interior comfort—the rear quarter panels can now be opened to increase ventilation.

NEW ROLLS ROYCE V-8

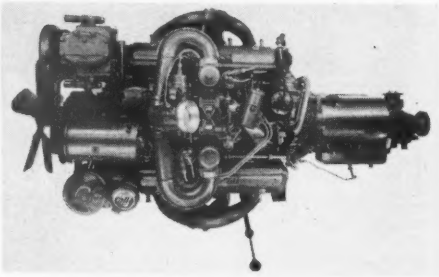
Designed to replace the 6-cylinder in line engine in use on Bentley and Rolls-Royce cars for many years, an aluminum V-8 of 6.2 liters capacity goes into the latest models of the Silver Cloud and the "S" Series Bentley.

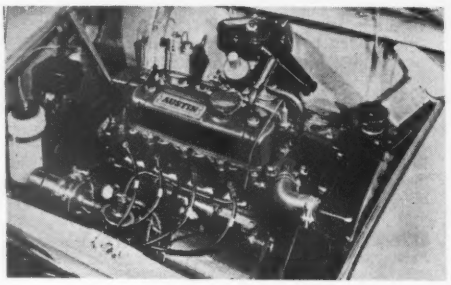
The new engine is an over square 90° vee unit that offers incredible smoothness at all speeds. Bore is 4.1″, the stroke 3.6″—overhead valves are operated by hydraulic tappets. The cylinder block and heads are cast in high silicon content aluminum alloy. The cast iron cylinder liners are wet; valve seats are of austenitic steel while cast iron is used for the inlet valve guides and bronze for the exhaust guides. The five main bearings of the crankshaft are copper-lead-indium lined steel shells. The monikrom cast iron camshaft is driven by helical gears.

Twin S.U. carburetors are of a special diaphragm type and incorporate an automatic choke for cold starts.

The engine is no heavier than the six it replaces. Compression ratio is held at 8:1; the Rolls-Royce automatic transmission remains unchanged, though change-up speeds on full throttle are now: from 1st to 2nd at 23 mph, 2nd to 3rd at 40 mph, and 3rd to 4th at 78 mph. Maximum speed is in the neighborhood of 108 mph, only a slight improvement on the old car. But mid-range acceleration has been bettered considerably. Peak revs are 4000 rpm, and naturally torque and power figures are not quoted by the factory—as before it is termed "sufficient". The factory can however, say this with even more confidence that they are right.

The brakes on the Bentley Continental now are four shoe. Actually what has happened is that the two shoes have been divided in half, which gives four separate contact points on each drum.





Upper left: New Rolls Royce V-8 marks the first departure for this firm from the traditional straight six cylinder layout. Lower left: BMC mini-car engine is set transversely in chassis. Right: First significant body change for Porsche.

Perhaps only of academic interest to SCI readers is the new Rolls-Royce Phantom V, a car designed for the diplomatic corps and heads of state; it is the largest Rolls ever made with an overall length of just under 20 feet. Wheelbase is 12 feet and only bodies by the specialist coachbuilders will be fitted to the new chassis. Of course servo-assisted brakes and steering are standard equipment. The frame is a stiffened box section with cruciform center section. Weight of the P-5 is not yet available as a completed car does not exist at press time. Turning circle is 48′9″! Price is only $24,050.

BIG NEWS FROM BMC

The Morris Mini-Minor and the Austin Seven announced at the end of August, 1959, are the two of the most revolutionary British cars to appear in some time. Both cars are very similar, incorporating the same mechanical components, which include a transverse mounted 850 cc 4-cylinder in line engine developing 34 bhp at 5500 rpm. The combined gearbox and final drive unit is located beneath the engine and is bolted to it; the same oil that lubricates the engine also serves the gearbox and final drive unit.

Independent all round suspension via rubber cones is the biggest sensation of all. These cones are at the front, mounted vertically, and are connected to the upper wishbone and controlled by hydraulic telescopic shock absorbers. Rear suspension is by single trailing arms on which hub and brake assemblies are fixed. Rubber spring units at the rear operate in a horizontal plane. No greasing is involved with this rubber suspension. Rack and pinion steering is fixed to the toe board of the body shell.

Hydraulic brakes, seven-inches in diameter, giving a total area of 67½ sq. ins are employed all round with a single leading shoe both front and rear. A new safety device is incorporated in the braking system of the new cars; this is a pressure limiting valve which, at a point near maximum braking, transfers full power to the front wheels, avoiding locking of the rear wheels.

This new model, the ADO 15 as both cars are designated, is the result of eight years of work by a team of B.M.C. designers working under Alex Issigonis. Back in 1951 an experimental front wheel drive engine and transmission unit was designed and tested with great success, the complete unit having been mounted transversely in an existing B.M.C. model.

The object was to produce a compact small car with adequate comfort for 4 adults. A car with an engine of modest size but more than enough power. Issigonis felt that the so-called "Bubble cars" of the 1955 period were not what the motoring public wanted and he pushed ahead with his new design in great secrecy at B.M.C.'s Longbridge factory.

The low center of gravity, weight distribution and suspension layout give the car impressive road holding and handling qualities. Test cars have covered up to 50,000 miles with the rubber suspension medium showing negligible wear.

Here are some brief performance figures; fuel consumption at a steady 50 mph is 51.8 mpg. The car accelerates from 0 to 40 mph in 12.6 seconds, from 0 to 60 in 28.9 seconds. Change up speed in third gear is 59 mph.

Cars are available in de luxe specification as well as plain trim; this includes two color leathercloth upholstery and foam rubber seat cushions, windshield washer, pile carpet flooring, adjustable front passenger's seat, as well as many other extras. *(Continued on page 14)*

THE BIG 4 NAMES IN IMPORTED CARS

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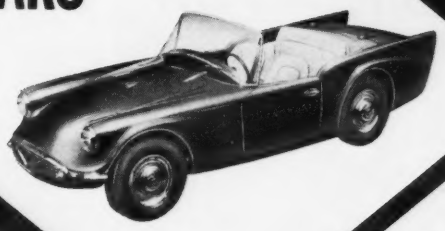

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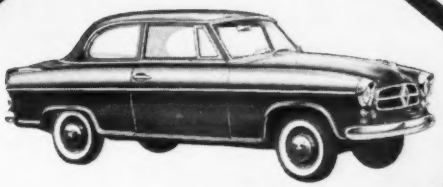

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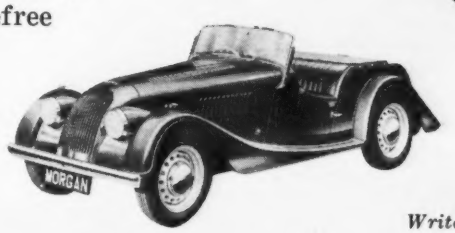

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A kit of various sizes and shapes of polishing wheels is marketed by Webco Inc., 218 Main Street, Venice, California. The wheels are made of abrasive impregnated rubber which is said to wear away evenly thus exposing new abrasive grains as work progresses. The wheels are not affected by fuels or oil, do not shrink or change texture, and are non-magnetic and non-conductive. The kit sells for $5.95.

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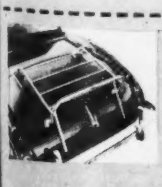

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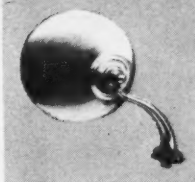

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Racing Steering Wheel

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State make, year, model of car. AH, Jag, MG-A, TC, TD, TF, TR 2 & 3, AC, Corvette, Porsche, Aston-Martin, Alfa Romeo 1300 only. Duralumin one-piece frame with rim made in contrasting laminations of light African Obeche wood and rich dark Mahogany. Hand French polished, finger serrations for a much more firm grip. This wheel is slightly smaller in diameter (16") and allows an ease of handling not experienced with stock wheels. No driver who has tried one has ever failed to express his enthusiasm for the distinctive Derrington wheel. The purchase price includes all necessary fittings. (Corvette 17" Dia.)

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New energy absorbing non-resilient liner as specified by the Snell Fund Study. This study conducted by Geo. G. Snively, M.D. is the first comprehensive racing crash helmet test ever made in this country. *Licensed by Topex. Helmet with visor **$38.50** postpaid, less visor **$37.00** postpaid. Sizes: 6¾" thru 7½".

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European News Letter

(Continued from page 10)

PORSCHE TYPE 356 B

As our November issues goes to press, the first few Porsche 356B's are coming off the assembly line in Stuttgart-Zuffenhausen. As can be seen they have been given a rather drastic face lift that will come as a shock to Porsche owners all over the world. The bumpers are several inches higher, both front and back and should offer more protection, particularly with the huge guards. The front fender line is higher and has thus raised the headlights a bit, reportedly increasing their effectiveness although we have not as yet been able to make any comparisons.

Interiorwise, the new Porsche is quite different. The dash remains the same, only the knobs are painted black, along with the new recessed wheel. There's a multi-purpose light switch at the left of the wheel, whose functions include, headlight flasher, direction indicators, and headlight dip switch. The gear shift lever has been redesigned and by means of a more direct linkage to the transmission, shifting is reportedly more positive in feel than before. By splitting the back of the occasional seat in the rear, it has now been made into two individual seats that are ideal for children. Head room has been increased slightly by lowering the transmission tunnel. Wind wings are now standard on all models.

But most important of all, the 356B has new brakes. They consist of redesigned bi-metal drum with lateral finning that improves heat dissipation.

We first saw these new drums on the experimental 1600 Super that ran at the Nürburgring last June. Fresh air is fed through special ducts at the front of the body—also new is a buffle system between the backing plate and the drum that keeps out water.

Still bigger news is on the engine side: Not only will the 65 hp normal pushrod engine and the 75 hp regular Super be continued, but in January the 356B will be available with a 90 horsepower pushrod engine, developing its maximum output at 5000 rpm, but revving to 6000 rpm quite easily. The power and torque curves of the "Super 90" (as the new engine is called) are exactly the same as the 75 horsepower Super up to 5000 rpm but up to 6000 there is a most impressive increase in steam. Klaus von Rucker and his staff have merely gone through the old Super and given it a careful hot rod job. Intake valves are larger as are with stronger valve springs the induction pipes, the crankshaft has been strengthened although a plain bearing crank is still used. Rocker-box breathers have been fitted and the Solex twin choke Carrera carburetors will be standard on the new engine. The camshaft is the same as the old Super; compression ratio is 9:1. All of this gives a maximum speed very close to 118 mph! Even more interesting, the "Super 90" will have as standard equipment a single leaf compensating spring, running transversely beneath the gearbox and reports reaching us tell of a large improvement in the car's handling by virtue of this new spring.

—*ja*

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The "Competition" is waterproof, dustproof, shock-protected and anti-magnetic. Its dial has a black matte finish that eliminates reflection. Its sweep second hand is red for high visibility. The highly luminous radiolite hands and dial make night reading virtually instantaneous. The large arrow on the hour hand prevents any confusion with the minute hand in darkness.*

Your car crest is imprinted with remarkable definition and clarity in white. In addition, each "Competition" is packaged in an elegant Swedish presentation case with your car crest imprinted on the cover in 24 karat gold. This unusual box is well suited for use as a cuff-link or small jewelry case. Can you think of a more desirable gift to yourself or anyone owning or admiring fine cars than this distinctive watch?

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DETROIT NEWSLETTER

by Mike Davis

ON STAGE!

► The house lights have dimmed and the critics are now seeing the long awaited new ploy from Detroit: The Compact Car.

Though based on earlier successes established with sketches of Rambler, Lark and Imports — which now make up the First Act — the millwrights have prepared their complete production with something less than absolue self assurance. The reason is that a flop is a turkey and turkeys cost money and there have been turkeys before.

Let's briefly review Act One before reporting on the Second. Based on low ticket cost and overhead, plus a short program exciting at times and rarely boring, performances increased tenfold in just four years — to nearly one million sales for the '59 show. Two theaters have been saved from bankruptcy and the road shows have been prospering as never before.

Now to the Act being staged.

Elsewhere in SCI this month you'll be getting more detailed reviews of Falcon and Corvair, so we'll just give you some overall impressions.

The scenes are nicely balanced and fortunately for the enthusiast offer a variety not seen in the showrooms for many years. There'll be choice, choice, choice for you to pay your money and take. This choice matter alone may be enough to set Detroit off to new attendance records, the likes of which it hasn't been seen since the last time it offered anything new.

Even though the producers are planning an output of well over 200,000 Falcons, Corvairs and Valiants before the end of December, demand promises to be so good initially that only Chevrolet will be able to make many customers happy by having enough cars to sell.

* * *

—The Ploy's The Thing, or Go To Your Ford Dealer for a Falcon —

Our impression of the Falcon was that of surprise . . . it is a Detroit car with typical soft springing, jazzed up interior (in the deluxe model), and automatic transmission (optional at extra cost). Yet it is also a departure from American models of recent years: clean lines, simplicity, great ease of handling. A very pleasing, personal car for family use. The car we examined and drove was a preproduction model, so it's too early to tell much about appointments and quality. Ford Motor Co. has been on quite a quality kick lately, however, and evidence should be seen in the Falcon.

It's obvious Ford's going all out for economy in the Falcon. Performance, by modern Detroit standards, leaves much to be desired: 0-60 in 25 seconds, top of 80 (with Fordomatic and an engine slightly out of tune). One Ford tub-thumper said mileage of the 85 h.p. Falcon with its 144 cu. in. OHV 6 would be nearly *twice* as good as the '59 Ford with a 145 h.p., 232 cu. in. OHV 6.

Here's food for thought: the little six in the Falcon leaves plenty of room in the engine compartment. We didn't have a tape measure handy, but it sure looked like there was room for a small V-8. Could this be the gambit for '61? Both the Lark and 108-inch wheelbase Rambler offer V-8's, remember. On the other hand, that would raise cost another $100 and, besides, Ford may need some spice for the small '61 Edsel — due in Act Three.

For comparison, we ran a first cousin of the Falcon, the English Zephyr, alongside. Incidentally, there is substantial resemblance between the Falcon, Zephyr and German Taunus. Much of the engineering for Ford's Imports was done in Dearborn, and some was borrowed back for the Falcon, undoubtedly. Test models of the Falcon were run, and still are, in Zephyr bodies.

Anyway, we had a brand new Zephyr convertible with stick transmission, so it had more snap than the four-door Falcon with automatic transmission. The Zephyr engine is about a dozen cubic inches bigger than the Falcon, and develops about ten h.p. more.

The Z cornered better than the F, as might be expected with its European hard springing. It went around turns flat while the Falcon leaned, oh how it leaned. But the F could keep right up with the Z with a little pushing . . . with a straight stick, it would probably be a dead heat.

The F went over the Ford Romeo (Mich.) Proving Ground's washboard road section as smoothly as a marble on a blackboard . . . while the Z broke loose. In fact the F could take the stretch a good five m.p.h. faster than the other before losing it. Due to the low silhouette of the Falcon, the seats are not quite so high and thus are as comfortable as in the English car.

Compared to other American cars, especially the Rambler and Lark, our impression is that the Falcon is distinctly ahead in roadability. (But then we haven't tried out the '60 models of the others yet.) The Falcon is exceptionally quiet, too, for Detroit iron, or anybody else's for that matter.

As Chrysler's Styling vice-president, Virgil "Forward Look" Exner says, "Neither words nor photographs do justice to an automobile." We think the Falcon is a satisfying car, much better looking than we ever expected — better proportioned — and we await production models with some interest.

CORVAIR'S GOT THE AIR, MAN

There is bound to be plenty of disagreement about this — horseracing, women, cigarettes and liquor not withstanding — but we think the Corvair is the plain jane styling-wise among the Big Three's Little Three.

On the other hand, it's way out there, man, when it comes to new engineering features. How much new can you have in a car? Aluminum block, air cooling, opposed cylinders, transaxle, trailing arm

(Continued on page 18)

PUT YOUR FOOT DOWN—AND LIVE! The new Austin Healey '3000' is for those who love the feel of the sun and the wind. This car is alive. It responds in a flash. Accelerates with surging power. Corners like a polo pony. Disc brakes for sure, straight-line stops. It's the fabulous successor to the famous Austin Healey 100-Six which has dominated competition in its class. Top speed, a breathtaking 115 m.p.h. It's built for the track, yet takes to pleasure driving beautifully. For as low as $3051 p.o.e. (2- or 4-seater).

FACTS FOR THE SPORTS CAR CONNOISSEUR: 1. A 2912 cc engine with twin carburetors. 130 b.h.p. at 4750 r.p.m. 2. DISC BRAKES on front wheels for smooth, straight-line stops even at racing speeds. 3. GEARBOX. 4-speeds (6 with overdrive). Synchromesh on 2nd, 3rd, and top speeds. 4. INDEPENDENT FRONT SUSPENSION, with hydraulic shock absorbers and stabilizing bar; semi-elliptic leaf spring rear-suspension, with hydraulic shock absorbers and panhard rod. 5. BODY. Steel/aluminum, adjustable bucket seats trimmed in leather. 6 AVAILABLE in either 2- or 4-seater, standard or deluxe models; detachable hardtop optional.

A product of THE BRITISH MOTOR CORPORATION LTD., makers of Austin Healey, Austin, MG, Magnette, Morris and Riley cars. Represented in the United States by Hambro Automotive Corp., Dept. 8, 27 W. 57th St., New York 19, N.Y. Sold and serviced in North America by over 1000 distributors and dealers.

Detroit News Letter

(Continued from page 16)

rear suspension, rear engine, fuel tank tucked behind the front suspension.

About the only thing it doesn't have is torsion bar suspension — and the Chevy trucks for '60 got that!

The Corvair, by all odds, will be the most controversial car to hit Detroit since the ill-fated Tucker of nearly 15 years ago. The Tucker, you may recall, also had a rear-mounted six cylinder opposed piston engine — with a 126-inch wheelbase. The only other biggish car with a rear engine in recent years has been the Iron Curtain's Czech Tatra, with a 2½ litre air cooled V-8 developing 100 h.p. on a 108-inch wheelbase also.

Ed Cole, Chevrolet general manager, has been tagged as the man behind the Corvair, and particularly its rear engine. During the war, he was an engineer at a GM tank plant in Cleveland where he first encountered air-cooled rear engines in the armored vehicles. But it took advanced technology with aluminum to make the rear engine feasible in a U.S. passenger car.

A LOOK BEHIND THE CURTAIN

While Falcon and Corvair ham it up centerstage, another ingenue waits, heart palpitating, in the wings. Valiant, the third scene in Act Two of the celebrated mid-western drama, will be on later this month. Meanwhile, we've been plucking the fruit off her family tree and we're impressed.

Two years ago at a stockholders' meeting, Chrysler prexy Lester Lum Colbert reported that Chrysler had been building small cars since the 1930s. His words were greeted somewhat skeptically by the press, but he wasn't kidding. Even more interesting is the fact that Harry E. Chesebrough, who was in charge of Valiant development and is now responsible for sales as well, worked on the early small cars when he was fresh out of engineering school in 1932.

1933 — The first Chrysler small car was a coupe and looked something like a 1937 Terraplane coupe or the first postwar Fiat coupe. It had advanced styling for the time with a rounded, sloping hood and grille, suggesting the Airflow models, but with bug-eyed headlights atop rather than set into the fenders.

1934 — This small car was really a coupe model of the DeSoto Airflow, mounted on a 100-inch wheelbase.

1935-6 — Prototypes run over public roads hidden under a more-or-less 1935 Ford! This car had a five-cylinder radial air-cooled aircraft-type engine — like the first Volkswagen prototype in 1931, but mounted in the front in combination with front drive.

Since the drive was at the rear of the engine, the front wheels were placed further back along the body than usual. Rear suspension was transverse leaf springs. According to an engineer who worked on the project, the five cylinder engine was dropped mainly because of its bulk. Noise must have been a factor, too.

(Continued on page 20)

SEBRING 1959

America's greatest sports car race brought to you in two amazing LP releases. SOUNDS OF SEBRING 1959 —the sounds and voices—with on-the-spot reports of this greatest sports car regatta (it sure rained at Sebring this year). And in addition we set up our microphones on the Warehouse straight and succeeded in surpassing all of our previous recording efforts. SPORTS CARS AT SEBRING IN HI-FI (or STEREO) bring you the fantastic sounds of up and down shifting, accelerating and braking of all the cars, including DB, MG, Austin-Healey, Porsche, Ferrari, Aston Martin, Maserati and Lister Jag. Just pure sounds. Both releases available in monaural and stereophonic.

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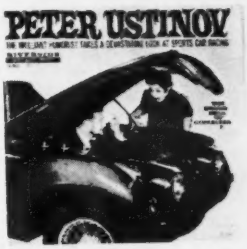

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Detroit News Letter

(Continued from page 18)

1937 — A "finished" prototype of the radial-5 was tested on public roads. It still looked in some respects more like a Ford than Chrysler product, no doubt deliberately to confuse corporate spies in the days before secluded and private proving grounds. Most startling was the car's styling resemblance to Dr. Porsche's prototype Volkswagen Series 30, produced late in 1937. There are reports that Chrysler engineers showed Dr. Porsche their small car when he visited Detroit in 1936. The obvious resemblance is unmistakable and leads one to the conclusion there must have been some cross-fertilization.

1938-9 — By this time, small car designs were larger, more conventionally powered and resembled Plymouth four-door bodies of the 1937-41 vintage, though smaller.

1944 — A small coupe version of the famous 1941 Chrysler Thunderbolt was modeled up in war-time Chrysler styling studios. The 1949-52 Dodge and Plymouth business coupes were copied from it.

1945-6-7 — Right after the war, Chrysler was earnestly at work on a small car project, the car to be known as "Cadet". Chevrolet was designing a small car at this time and Ford is believed to have made some motions, also.

The '46 small car — it would have been introduced in 1949 — was tested with a water-cooled four-cylinder flat head opposed piston engine, mounted in front, but with conventional rear drive. The big objection to this power plant was that "it was a helluva package to put between the front suspension members."

The operational prototype was styled much like the larger 1949 Plymouth sedan, which was being laid out at the same time. Some versions looked like the 1950 Hillman.

From 1949 through 1952, of course, Plymouth and Dodge both had stripped economy models on shorter wheelbases than the standard cars, but with the exception of the all-steel Plymouth Suburban, they never took. In 1953 and 1954, Chrysler apparently misjudged the market with Plymouths and Dodges "bigger on the inside and smaller on the outside." Chrysler has yet to regain the share of the market it lost with those well designed but badly timed cars.

GEAR DUST AND AXLE DRIPPINGS

Oft-quoted remark about the '60 Cadillac: "It's been tail-lifted."

General Motors execs are predicting 1960 auto sales of 6.9 million in the U.S., including half a million imports. There are some people in Detroit who think it might even go past the record 1955 sales of 7.2 million, though imports would cut the sales of U.S. automakers still below '55 levels.

One source, not in GM, says the B-O-P small car will be out in the winter. The small Edsel could make it in the spring, maybe with front drive. Economy will be a big selling point with the medium priced cars as well this year.

—*md*

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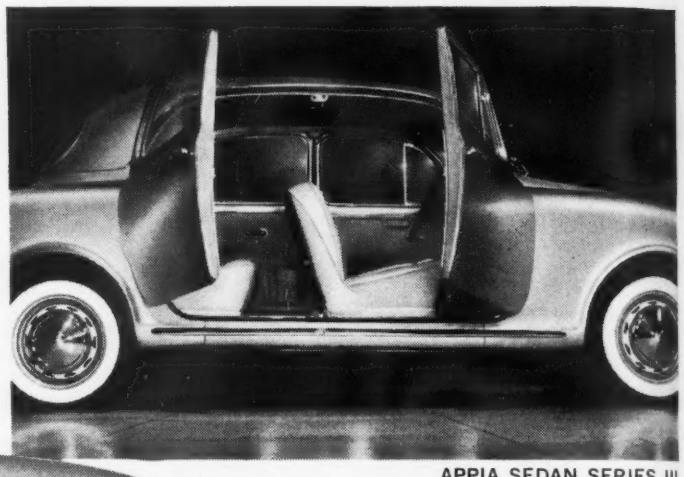

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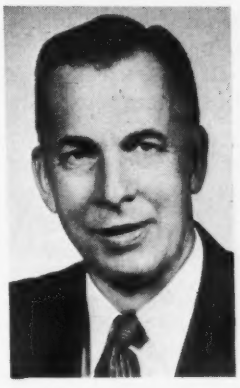
SCI ANALYZES Ed Cole's CORVAIR

by Karl Ludvigsen

CHEVROLET



► It looks as if Ed Cole threw up his hands and said, "Okay, okay, I've had enough. Let's build this car that all the critics and magazines have been asking for and *then* see how they like it. We'll do everything they suggest and add a few ideas of our own." That's about what Chevrolet has accomplished with the Corvair. It is the most profoundly revolutionary car, within the framework of the U.S. automotive industry, ever offered by a major manufacturer.

It is a fact that, unlike the Corvette SS (promoted by GM Styling) the impetus for the Corvair came directly from Ed Cole, the engineering-oriented Vice President in charge of Chevrolet Division. When the first meetings were held in the Fall of 1956 it was possible to review fairly complete proposals for both the mechanical layout and styling of a "smaller car" which had already been prepared just in case by the Research components of both the Styling and Engineering departments. By Fall of 1957 these had been translated to detail drawings and to prototype engines which were put to work on the test benches and in such divers vehicles as a Porsche and a gutted Vauxhall sedan. A handful of complete prototypes were then built, along rather bulbous lines which have become familiar to readers of our contemporary, *Motor Life*. The test engineers had a real ball sending to Australia for "Holden" insignias and trim for these cars and disguising them in general. They all had fraudulent grilles in front, of course, and one car—for testing down in the Kentucky/Tennessee area . . . even had a bug screen in front of the fake grille!

There was adequate time in the Summer and Winter of 1958 to hammer the prototypes across the country from the 120 degrees of Mesa, Arizona to 30 below at Duluth, Minnesota, proving many features, but primarily the feasibility of air cooling. In the meantime the stylists had completed their revision of the lines, enabling Fisher Body to put together the final prototypes for debugging in early 1959. Only the four-door edition will be introduced for 1960, but other body styles are sure to follow if the Corvair is well received. What about a station wagon? The Chevy line of thought may be traced from a VW Kombi we saw at the proving grounds, completely outfitted with Corvair engine and suspension, used ostensibly to test the Corvair components. The possible commercial applications of the Corvair's simple and practical propulsion unit aren't likely to be overlooked.

The Corvair bears no direct relation to the somewhat similar "Cadet" project initiated by GM just after the war. Under the direction of Maurice Olley an exhaustive study was then made of all possible engine and vehicle configurations and a final proposal reached which in shape foreshadowed the 1948 Packard. The whole deal was called off probably with good reason. We hope it may be possible at some future date to publish some of the details of the Cadet study.

THE "CHEVY-VW"?

With only a slight attempt at badinage the Corvair project was frequently referred to at GM as the "Chevy-VW", an appellation which has very meaningful overtones. The completed Corvair reflects the same brand of restless, ruthless emphasis on essentials that characterized most of Dr. Porsche's work. It parallels the Volkswagen's imaginative approach to utility, but within the North American frame of reference, and in realistic fact closely follows the VW line in its actual general layout.

For their first essay at unitized construction in this country, GM engineers have gone the whole way. That is, there was no intermediate platform or backbone frame stage (though in all fairness a current X-frame GM car derives about 70 percent of its torsional stiffness from the body) and the integrated Corvair retains only the most subtle vestiges of a frame. At the front a pair of hat-section rails curve back from the bumper mounts over the front suspension to blend with the underbody, taking on the qualities of boxed members where their open face is closed by the wheel housings. With deeply boxed side, cross and vertical members, the body proper uses few new techniques. Over the rear suspension and alongside the engine it's also reinforced by an additional pair of channel-section members extending to the back bumper.

Many happy returns to sanity are evident in the Corvair, one being the use of an old-fashioned non-wraparound windshield which makes it a lot easier to get in and out of this relatively small car. Further help comes from the doors, which are very wide and open at a generous angle. Locking is effected by the interior handle instead of the traditional GM window sill buttons. Though the

door pillars aren't especially slim they're well placed, and vision all around is superb. A special effort was made to reduce costs in the instrument panel layout, but it doesn't show it. (It isn't as cheap as they had hoped, either!) Easy adaptation to right-hand-drive is facilitated by the twin-hood layout, the radio, when fitted, being slung from the center of the dash. A 100-mph speedometer is accompanied by a fuel gauge of a new, more accurate counterbalanced-pointer type. A warning light flashes on if the oil's temperature is too high or its pressure too low, while another lights up if the fan belt ceases to drive the generator or blower. Even on the deluxe 700 model (chrome window moldings, door-operated interior light) there's no horn ring on the appealingly simple steering wheel.

For a tall driver the Corvair offers plenty of head room, and the unobstructed floor leaves adequate area for big feet, but Chevy engineers didn't quite catch the secret of the VW's remarkable habitability. When only two passengers are riding in the German car — the most common situation, you'll grant — it's possible to move the front seat well to the back, almost touching the rear seat. Attempting to retain rear seat leg room under *all* circumstances, Chevy limited front seat travel just at that point where a moderately tall driver feels somewhat cramped. A running change to a longer rearward travel is respectfully but urgently suggested.

LUGGAGE LOCKERS

Similarly, if Renault's clever stowage of the spare tire had been imitated or at least paralleled the Corvair's "trunk" would not be any roomier but would have a more usable shape and would be easier on fine leathers. About 9½-cubic feet at the front are supplemented by a 4½-cubic-foot volume behind the rear seat, VW-style. A very attractive option at moderate extra cost is a rear seat that folds forward, station-wagon-style, to form a flat platform from the front seat to the firewall on which most anything can be heaped. The conversion can be made quickly and easily.

Some trunk space is stolen by the optional gas-fueled heater developed by Harrison Division of GM to lick the twin heating problems of a car that is both rear-engined and air cooled. A 2700 rpm centrifugal blower supplies air to the seven-inch cylindrical stainless-steel burner, which receives fuel at 4 to 5 psi from the engine fuel pump and is lit by a simple igniter which continues to spark constantly while the unit is in operation, as a precaution against "flame-out". Before passing to a tiny exhaust pipe under the car, the hot gases from this burner flow through a heat exchanger which warms the interior air, drawn from the cowl vent and fed to the cockpit by a two-speed centrifugal blower. A thermostatic control adjusts temperature by turning the fuel supply on and off as required.

Several precautionary controls are provided. One switch cuts off the gasoline supply if the unit temperature rises too high, while another does the same if too much fuel drains back, unburned, to the gas tank. A third switch keeps the combustion blower running half a minute after the heater is shut off, to purge all gases from the system. Chevrolet states that the maximum possible fuel consumption of the unit is about a quarter of a gallon per hour, a more normal winter figure being a tenth of a gallon per hour (or ten hours per gallon). This seems a moderate price for instant and powerful heating. Convenient to all this is the 11-gallon gas tank, nestling between the front suspension and the toeboard. It's held up against a fiber cushion by a single transverse strap and receives fuel from a filler on the leftfront fender.

BODY DETAILS

The rear "hood" (Chevy is just as confused over what to call these lids as SCI) is opened by pressing a trigger next to the license plate light. Like all the crevices at top and bottom of the engine room this trigger is rubber-sealed to en-
sure that the air flow goes just as the engineers planned, a detail
that was found essential to quick hot starting. Cooling air enters through
rear deck louvers equipped with pans to catch and drain away rain wa-
ter. Aerodynamic tests made recently, well after the styling was finalized,
indicated that by lucky chance there was a high- pressure area just
over the intake louvers!

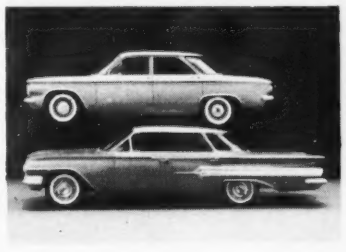
Ned Nickels and the special studio set up for Corvair body design
deserve all possible credit for a shape which has proved aerodynami-
cally sound and which also, less definably, reflects the functional and use-
ful character of the Corvair without actually flaunting these facets of the
car. Its lines are trim and meaningful and its orna- mentation more re-
strained than on most European cars. Assembled completely by Fisher,
the body is united on the line with suspension and engine in very quick
time, the chassis assemblies rising to meet the descending body shell.

Bolted directly to the body, a massive boxed crossmember carries all the front suspension parts and permits initial wheel alignment even before the subassembly is joined to the car. Stamped upper wishbones are inclined rearward to combat nose-dive on braking, while the lower wishbones are divided into two parts, as has been done by Chrysler for some time: a stamped hat-section arm carries the lower of the two ball joints as well as the bottom ends of the coil spring and concentric shock absorber, and is braced by a rod which trails rearward at about 45 degrees. Caster can be set by varying the screw adjustment at the rubber-cushioned chassis end of this rod, which would shift the position of the lower ball joint in relation to the upper one. Rubber is used liberally to damp out sound transmission to the unitized body, there even being a rubber

shim between the top of each coil spring and its retaining cup. Although an anti-roll bar was fitted on many of the prototypes and in fact appears in some of the early publicity photos, it is not being used on at least the first cars to roll off the Willow Run line.

A neatly detailed three-piece track-rod steering linkage is actuated by a recirculating ball gear encased in an aluminum housing. The ratio of the gearbox is 18 to 1 and that of the whole system 23.5 to 1, values midway between those of the Corvette and the standard Chevrolet. Even adding the fact that only 38 percent of the Corvair's weight is on the front wheels, bald figures like these cannot convey an inkling of the excellence of this car's steering. It is so light that at parking speeds it feels power-assisted; it is so precise as to be absolutely without play, and it is fast enough to allow complete control over every situation. In speed and smoothness and in that delightful ability to "wish" a car around a bend, even an early-type Porsche would have to give points to the Corvair. Judged by itself, the steering system is among the finest I have ever had the pleasure to handle. It's even unusually easy to direct in reverse.

New answers to the braking question are also provided by the Corvair's rearward weight bias. Forward transfer of weight on braking brings the weight distribution close to 50/50, so 9-inch brake drums with equal-sized linings 1¾ inch wide are fitted all around, for a total area of 120.8 square inches. To guarantee that the back wheels lock up first on a panic stop the front/rear braking ratio is an initially surprising 46/54, obtained by fitting the com- pound servo mechanisms with ⅞-inch cylin- ders in front and 15/16-inch in the rear. A one-inch master cylinder and filled tegral reservoir is hung from the dash struc- details only hint from the luggage compartment. Again these comes to a halt. at the unusually even, stable way the Corvair maximum braking It crouches flat and close to the ground with are equally doled traction even on gravel surfaces. Heat loads leading to the out among the drums but their size is small, not be exceptional. tentative conclusion that fade resistance will



A determined amount of misalignment is allowed at the Corvair's rear hubs, requiring a brake adjustment there five notches looser than at the front. Also on board is a novel hand brake found on the big Chevys as well. Its returning ratchet action allows the brake to be applied firmly in one long pull or several short ones, the release lever popping out to indicate that the brake is applied. A specially powerful hand brake was in order for the Corvair from the beginning since no "park" position was designed into the automatic transmission. 13-inch wheels were chosen because they and their tires tend to be inexpensive; a 5½-inch rim gives good sidewall support. It was hoped that the low profile of the new-type 6.50x13 tires would be a boon to the handling of the rear-engined Corvair when carrying, to quote Chevy, "normal inflation in the rear tires and a reduced pressure in the front tires". This works out to 15 psi front and 26 rear when cold, or 18/30 psi at operating temperature, a radical differential however you look at it. Whether or not you're sympathetic to the cause of the Corvair you must admit that the need for such a difference reflects poorly on the basic chassis design. Quite apart from this, it's unlikely that most Corvair owners will ever maintain the pressures recommended.

Mercedes' solution for the front end of the 180 series is recalled by the logical, neat rear suspension and powerplant package of the Corvair, the mounting of which serves to insulate the main body shell from engine and rear wheel oscillations. The semi-trailing swing arms of the independent rear suspension are rubber-bushed to forged pivot shafts, which in turn are bolted to a wide box-section crossmember. The latter develops at its extremities into abutments and housings for the shock absorbers and coil springs. Four rubber mounts join this crossmember to the body. Wheel hubs are hidden within the deep, fully-boxed ends of the rugged swing arms. The coil springs are compressed pans spread within the crotch of the swing arms.

A departure from pure swing axle geometry is made here, as in so many other cases (VW, Fiat 600 and 500, early Lancia Aurelia) to lessen the camber change with wheel travel and to introduce toe-in deflection as an inducement to understeer, both without going to the extreme of pure trailing arm suspension (Renault Fregate) which tends to reduce rear cornering power in roll. The pivot axis of the Corvair's swing arms is inclined at about 40 degrees to the longitudinal centerline, which means that the layout tends more toward the swing axle side of things. The spring rates at the wheels are 86-pounds-per-inch in front and 192 at the back, the actual rate of the rear coil being a hefty 550-pounds-per-inch, over twice that of the rear coils of the big Chevy sedan which actually has a smaller rear wheel design load.

Let us be honest, as usual: The Corvair is fundamentally a profound oversteerer. With 62-percent of its weight on the back wheels it could only be otherwise if very ingenious suspension techniques had been called into play. This was not the case. As cornering forces on the Corvair chassis increase there is an initial very mild understeer tendency, probably attributable to the rear suspension geometry, but then, well within the average driver's range of slip angles, oversteer sets in in a gradual way that is easily countered by the excellent steering — whose very lightness, of course, is in part a function of the oversteer.

text continued on page 30

CHEVROLET

1. The problem of adequately heating an air-cooled car is solved by this gasoline heater installed in luggage compartment.
2. The car is easily converted to right-hand drive due to the symmetrical dashboard.
3. Bob Clift, Chevrolet engine development engineer, peers into odd-shaped "trunk". Spare tire would have been better placed under floor as on Dauphine.
4. To make up for lack of front luggage space, the area behind the rear seat is quite large. With seat folded, more can be carried.

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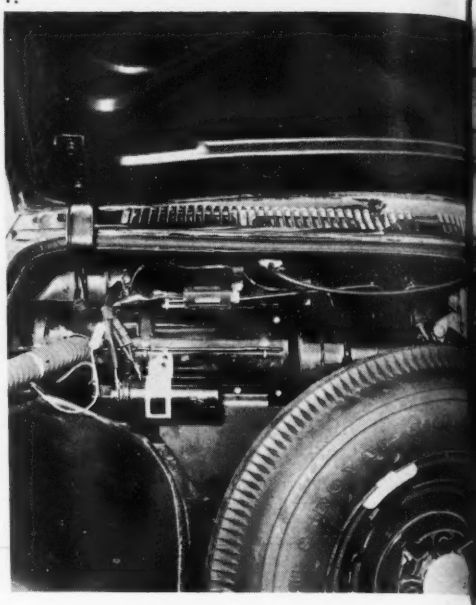

1. Prototype Corvair body in assembly stage.
2. Drawing shows general layout of body-frame unit construction.
3. An early preliminary drawing of the placement of the drive unit and front end components.
4. Engine and rear suspension assembly.
5. The left front suspension unit as viewed from the rear.
6. Right rear suspension. Axle shaft passes through rear edge of sheet steel wishbone.

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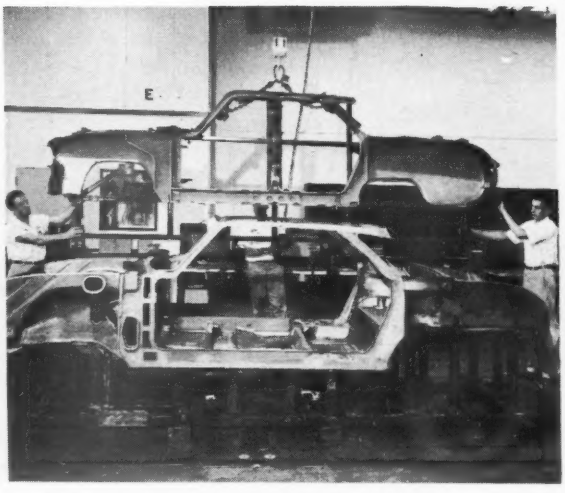

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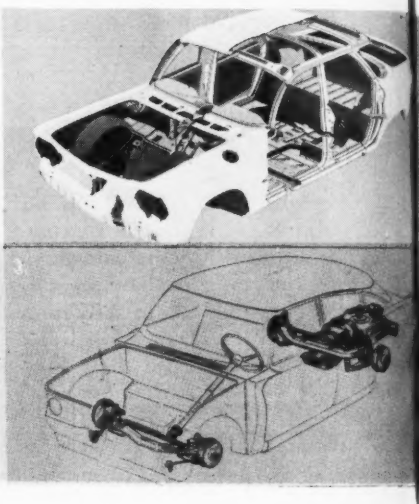

1. Cutaway drawing of Corvair engine as seen from the rear.
2. Corvair crank has four meaty main bearings and is very light even when compared with some foreign six-cylinder cranks.
3. Corvair piston and connecting rod.
4. Top view shows relationship of engine, transmission, and rear suspension.
5. Partly assembled engine on the line at Tonawanda, N. Y. engine plant.
6. The complete engine unit as it leaves the plant. Cooling fan bearing protrudes from top of engine, fan itself is belt-driven.

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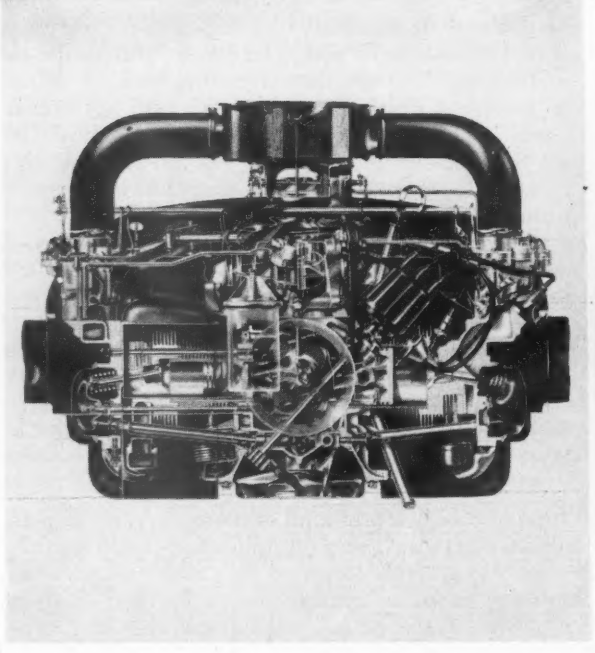

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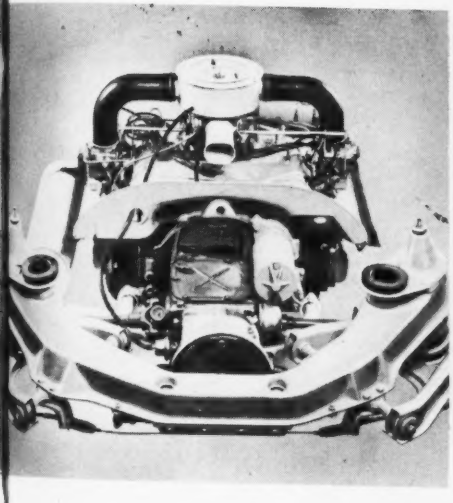

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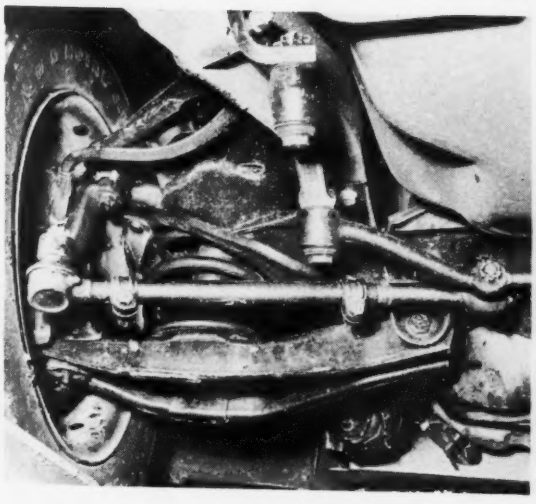

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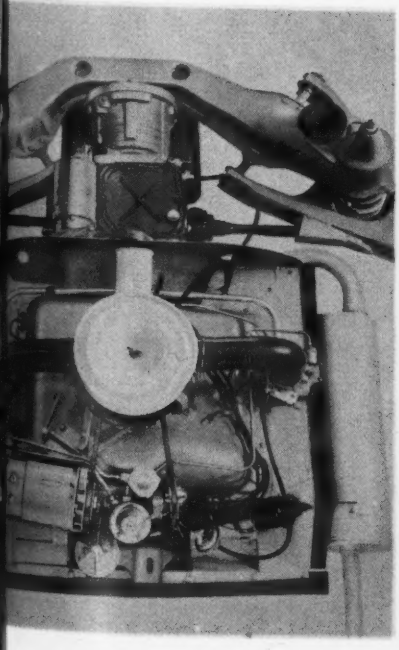

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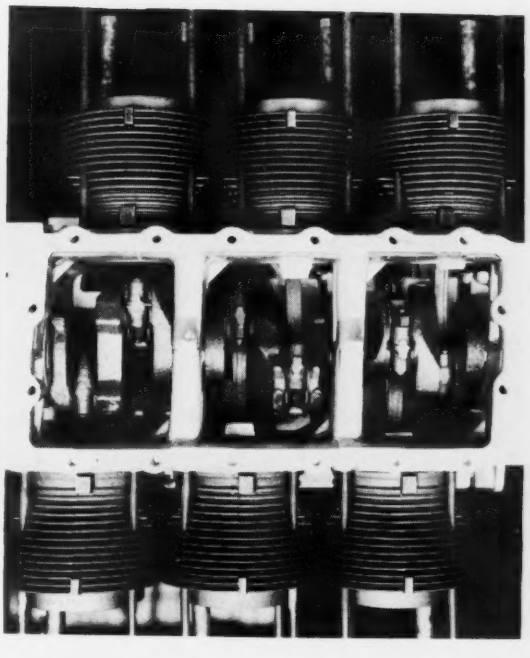

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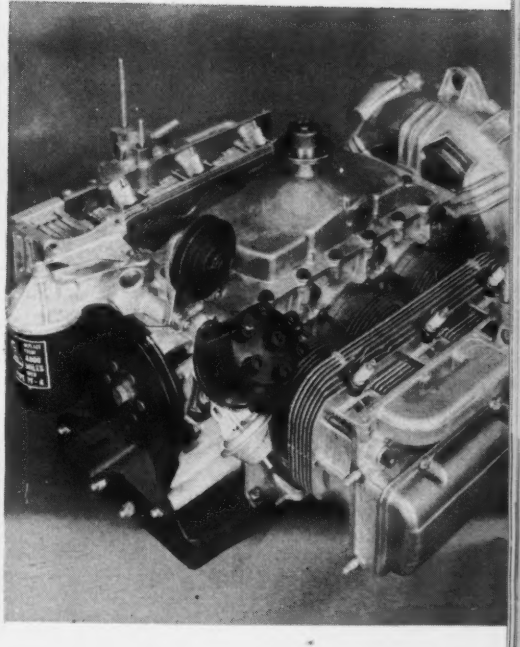
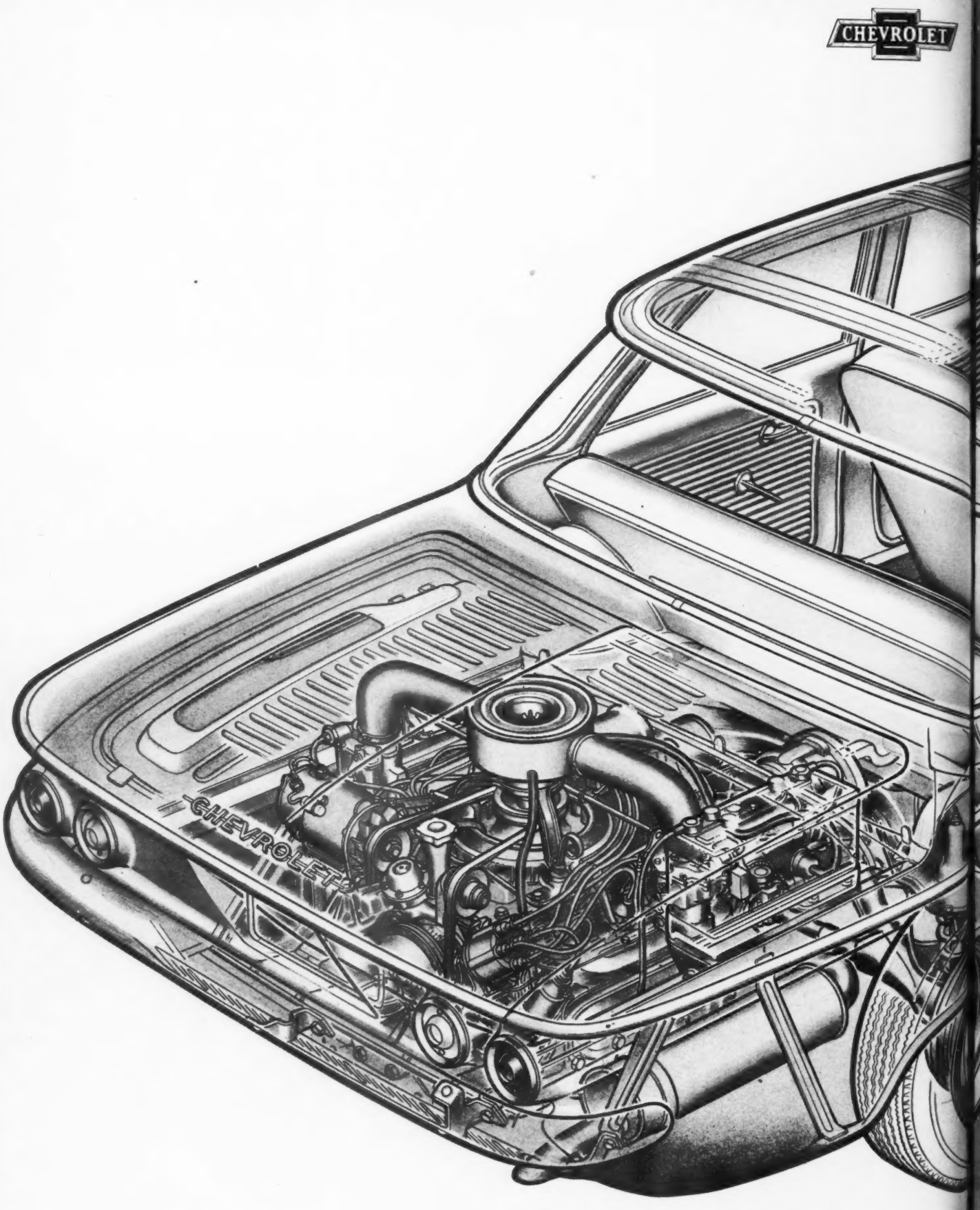
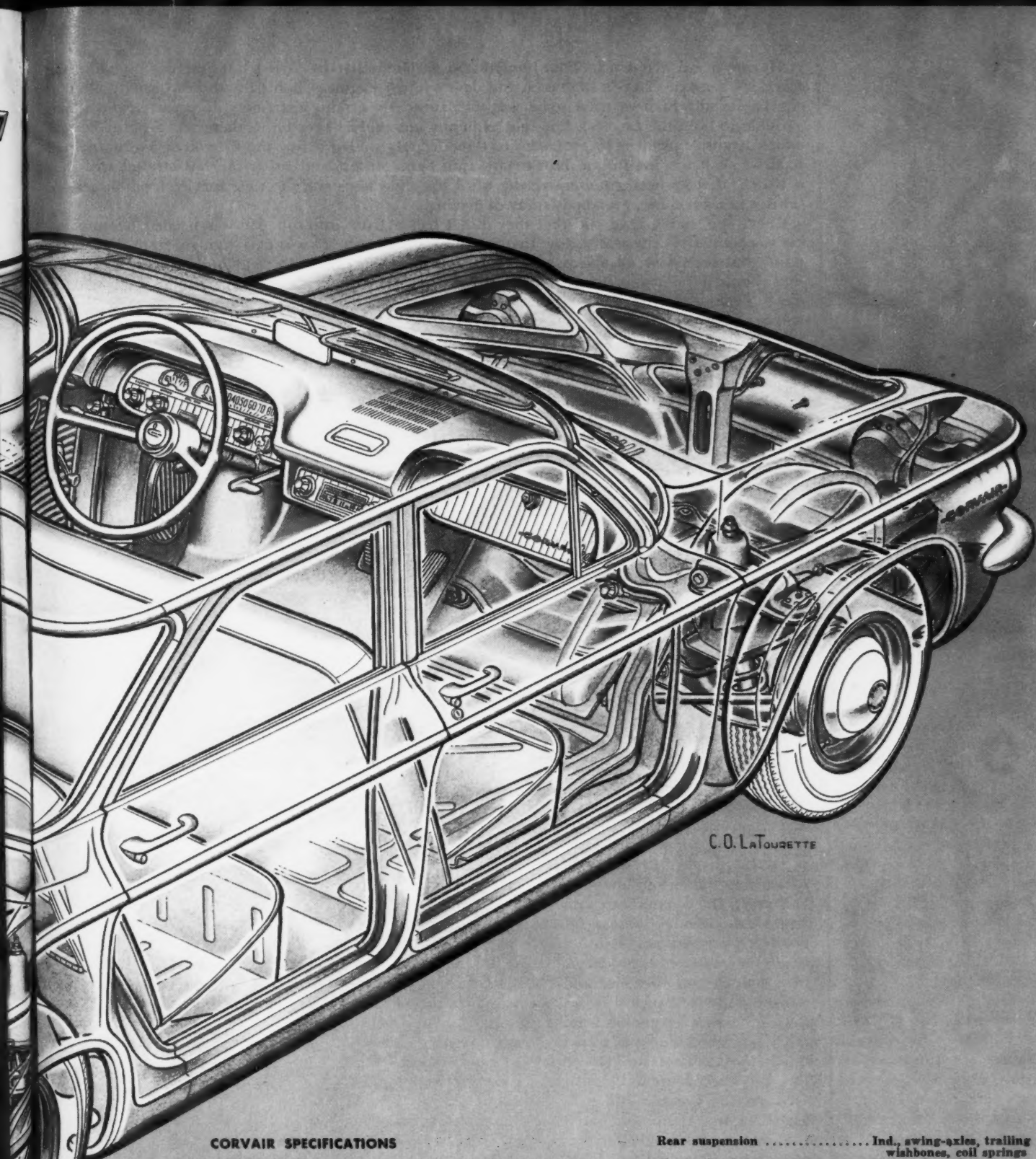



CHEVROLET
CHEVROLET



CORVAIR SPECIFICATIONS

POWER UNIT:

Type	air-cooled, flat six
Valve Operation	pushrod ohv, in-line
Bore & Stroke	3.375 x 2.60 in
Displacement	140 cu in
Compression Ratio	8.0/1
Carburetion by	Two Rochester single-choke downdraft
Est. Power	80 hp @ 4400 rpm
Idle Speed	500 rpm

DRIVE TRAIN:

Transmission ratios	overall ratio
I.....3.22	11.43
II.....1.84	6.54
III.....1.00	3.55
Final drive ratio	3.55 (3.89 optional)

CHASSIS:

Integral body-frame assembly	
Wheelbase	108 in
Tread, front and rear	54 in
Front suspension	Ind., coil springs and unequal wishbones
Rear suspension	Ind., swing-axles, trailing wishbones, coil springs
Shock absorbers	Delco telescopic
Steering	Saginaw recirculating ball
Turning diameter, curb to curb	39½ ft.
Brakes	9 in duo-servo drums
Brake lining area	121 sq in
Tire size	6.50 x 13
Recommended pressure, psi	15F, 26R

GENERAL:

Length	180 in
Width	67 in
Height	51⅛ in
Weight, curb	2415 lbs
Weight, test (est.)	2780 lbs
Weight distribution F/R, two up, full tank	41.3/58.7
Fuel capacity	11 U.S. gallons

RATING FACTORS:

Specific Power (est.)	0.58 hp/cu in
Power/Test Weight Ratio (est.)	19.9 lbs/hp
Piston Speed @ 60	1310 ft/min
Braking area at est. test weight	87 sq in/ton
Speed @ 1000 rpm in top gear	19.8 mph

Having heard that Uncle Tom himself had declared that he "tried but just couldn't lose the Corvair", I asked Chevy's affable engine development engineer Bob Clift to keep a path clear to the basement while we tried some very fast turns. By making extremely deep corrections it was possible to hold the car on a line but, as in any automobile ever built, there was a point beyond which it wasn't prudent to proceed. For a moderately skilled driver the Corvair is a genuine ball to drive, it being possible to hustle hard into tight corners and bring the tail around with just a twitch of the wheel, counter-steering until the slide stops and the time for acceleration arrives. This is not, of course, everybody's way of driving.

Chevy spokesmen have said that they didn't feel a front anti-roll bar was needed because the car's center of gravity was so low that it doesn't roll much. This is true enough, from that standpoint, but such bars are also powerful tools for adjusting handling, and one of the first things that should be done to this car is to replace that anti-roll bar. Since this would only actually counterbalance the difficulties that exist at the rear, however, thorough redesign should commence at that end. With the conventional design methods used, the high spring rates needed to support the rear end weight have resulted in unduly high roll stiffness at the rear, a sure harbinger of oversteer. A solution like that on the Mercedes-Benz 300SL Roadster is called for, having a single central coil or a pivoted transverse leaf spring to support loads without affecting roll. For all its novelty the Corvair is surprisingly naive in this major respect.

SOURCE OF POWER

The pivot axis of the rear swing arms was aimed right through the inner Hooke-type universal joints, allowing the slim axle shafts to swing in the plane of the arm and making outboard U-joints unnecessary. Minor length changes and servicing ease are catered to by short splines at the inner ends, while small misalignments at the hub end of the axle are accepted by the double-row "spherangular" roller bearings used at the hubs.

The engine/transmission assembly, of conventional rear-engine type in sequence and placement, is suspended at three points: two between the front of the transmission and the rear suspension crossmember, and one between the rear of the engine and the car body. The whole group is very easily removed for service in the familiar VW manner. It's not official, but one rough weight quoted for the whole power package, transmission not specified, was 340 pounds.

Ed Cole's decision to put the Corvair's engine in the trunk was in part predicated on his engineers' feeling that they knew enough about the use of light alloys in engine design to lick that tail-heavy problem. Apart from the validity of this, the flat-six engine does make generous use of high-duty aluminum alloys (high silicon percentage) formed in the only economical way, die casting. Throughout the engine no thread inserts are used, Heli-Coils or the like used only to salvage stripped threads, as a service operation.

Shoebox-shaped in general outline, with a total of four webbed bulkheads for main bearing support, the crankcase is split vertically down its middle. Eight through-bolts clamp it together around the crankshaft. The main bearings, like those for the rods, are basically a steel-backed copper-nickel mix coated with a thin lead babbitt overlay. Obviously overdimensioned to accept future stroke increases and given very generous sections and radii, this crankcase is a hefty item that will be reassuring to owners and promising to modifiers.

BOTTOM END PARTS

Realizing that in an aluminum engine proportionally more strength must be supplied by the crankshaft, Chevy engineers came up with a very sturdy forged steel crank with reasonably heavy cheeks but without counterweighting, by virtue of the good inherent balance of the opposed six. The No. 1 or rearward main bearings takes thrust loadings and is therefore .828 inch wide, the rest having a width of .772-inch and all four being 2.098-inches in diameter. The rod journals measure 1.80-inches in diameter and about .65-inch in width.

Scaling just 4.72-inches between centers, the connecting rods have a modest H-section shank which is, however, smoothly radiused into the big end. No circlips retain the .80-inch wrist pin, which is pressed into place in the small end of the rod. Of appealing slipper-type design, the pistons have a flat crown (for an 8 to 1 c.r.) and are lightly tin-plated. Two iron compression rings are backed up by a one-piece chrome-plated oil ring.

To get the Corvair into early production it was decided to release it with cast iron cylinders instead of the aluminum parts that may be introduced at a later date. Of course the goal is an aluminum alloy cylinder that is sufficiently wear-resistant to live without any special wall platings, as has already been done experimentally on the accessory engine of the Firebird III. On early prototypes of the Corvair engine the finning over the length of each cylinder was uniformly deep, but this apparently *overcooled* the lower portion of each cylinder, probably causing excessive wall friction, for the production cylinders have full-depth finning over their upper halves only.

These cylinders are very deeply spigoted into both the crankcase and the cylinder heads. The latter are identical left and right, a break for makers of special heads. Prototype powerplants used sand-cast heads with complex finning arrangements running in several planes, but the redesign for die-casting dictated a simpler alignment in a single plane. Also tried but found unnecessary was the sawing apart of the three combustion chambers in each head right to but not including the floor of the valve gear chamber.

(Continued on page 78)

CHEVROLET

1960 CORVETTE

Below: Corvette cockpit and controls have not been changed for 1960. The body lines — as well as the fiberglass material — also remain the same. In consequence resale value of 1959 Corvettes will not plummet.

by Karl Ludvigsen

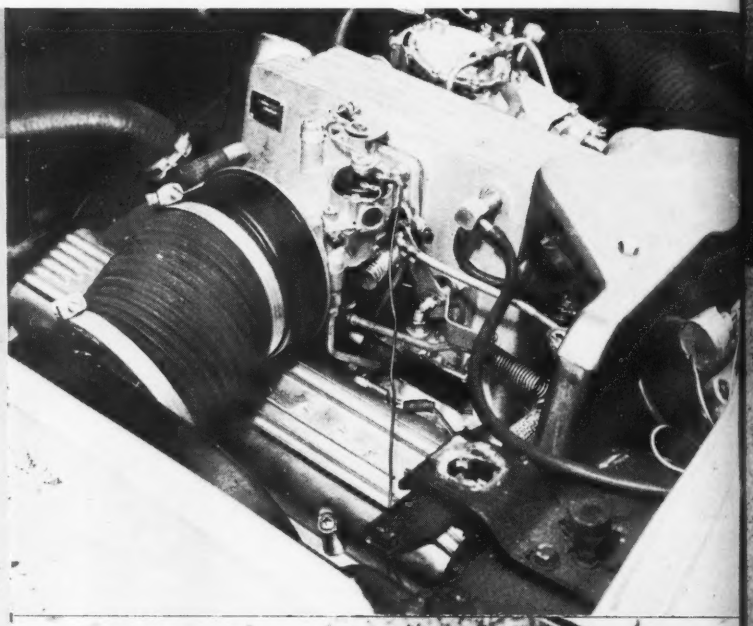
► 1960 will go down as the Year of Speculation for Corvette, SCI not being the only magazine that was caught well off base on predictions of radically changed styling and construction. New-type Corvettes along the lines theorized had actually been proposed, but the terrific engineering concentration on the Corvair project literally left no time for other developments. From the exterior and in all important respects, then, the 1960 Corvette is identical to last year's.

Major changes, and worthwhile ones, have however been made in the cylinder head design. On all Corvettes the valve chamber of the head has been widened to make room for a more efficient oil drainage system, incorporating a special drainage groove to lead oil away from the valve springs and guides. On fuel injection engines, moreover, the aluminum heads first developed for the SS Corvette have finally made an appearance, saving 53 pounds compared to the cast iron engine. This head has considerably different intake porting and intake valves enlarged from 1.72 to 1.94 inches in diameter. Correspondingly the plenum chamber of the injection unit has been enlarged to match the cylinder head improvements. With injection (available only with manual shift) also comes a special piston giving an as-yet-unspecified higher compression ratio.

If the Duntov camshaft is fitted, several other high-performance options can be applied. An all-aluminum cross-flow radiator can be installed, saving yet more weight, a cold-air tube adjacent to the radiator can be connected up, and the car in general converted to a raceable machine.

Optional within the standard sheme of things are asbestos-based or sintered iron brake linings, a third choice being the ceramic-metallic system available as a Regular Production Option (RPO). For 1960 there is no special handling kit,

Right above: A major change for '60 is the use of aluminum heads on the fuel injected engines. Heads were first developed for the ill-famed SS Corvette. They save 53 pounds over the cast iron units. Right below: Also added for '60 is this light rear anti-roll bar.



Zora Duntov feeling that some further mods to the standard chassis have made its handling good enough to do away with heavy-duty springs, etc. In addition to increasing rear suspension rebound travel by one inch, he has increased the diameter of the front anti-roll bar to 0.70 inch and has added a light-weight anti-roll bar to the rear suspension as well.

In action, this realignment of the Corvette's suspension reacts just about the way you'd expect. The Corvette has always been known as a strong understeerer that was fine for fast courses but less sprightly on slow ones and a shade wearying to handle in town. By increasing the roll resistance at the rear Duntov has brought the car closer to neutral steer feel on fast bends, where the Corvette now seems "lighter" on its feet and a shade more sensitive—not necessarily a good feel for racing use. The car can now be tossed around tight corners much more easily, but it must also be admitted that the larger rear roll couple tends to lift the inside rear wheel sooner than was the case before. A tentative conclusion might be that the new setup will be good for all-round use and for slower courses, with Positraction differential installed, but that many owners might usefully remove the rear anti-roll bar when trying for best results on fast tracks. During our Proving Ground trial we made no attempt to evaluate the performance of a fuel-injected Corvette, which obviously had acceleration on a par with its ancestors. Slight gains might be expected from the horsepower increase, now to approximately 305 bhp, and the weight reduction made both by the aluminum heads and the aluminum clutch bell housings used on all manual transmission cars. As before, the Corvette for 1960 is a formidable performer.

—kl

LOLA

TRACK REPORT

by John Christy

▶ Something that every do-it-yourselfer eventually learns is that although you can drive a screw with an old butter knife and hammer a nail with a brick, any job will be done better and easier if you use the right tool for the task. It's the same thing with motor racing. You can play Tazio Nuvolari around the race course in just about any car, but it is a whole lot more fun, faster and, in many ways easier if you do it in a car meant for racing, one that was built from the outset to excel at just that activity.

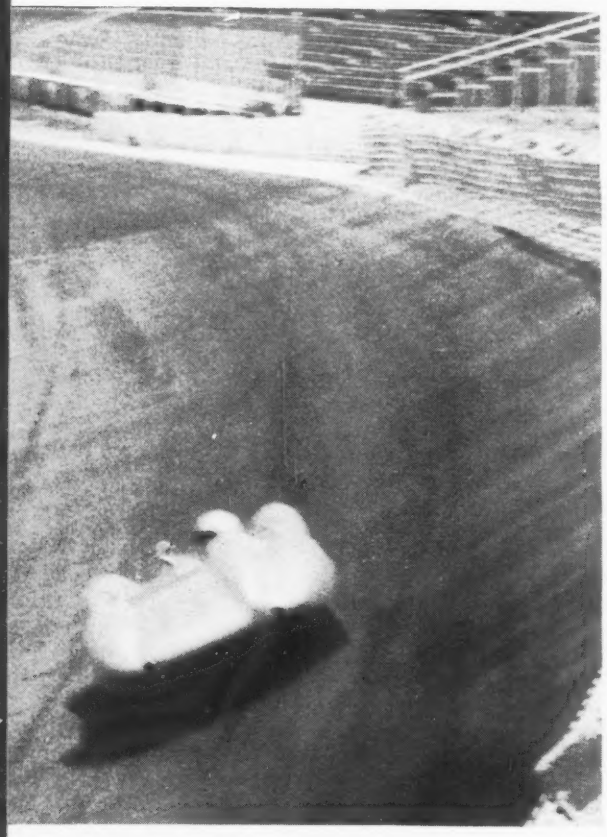
This was brought forcibly to mind one hot summer day when we met Lola. Not the choice little red-haired vamp of "Damyankees" fame but a choice little blue racing sports car. The only one of its kind in this country at the time, we had gone to Chicago especially to make the acquaintance.

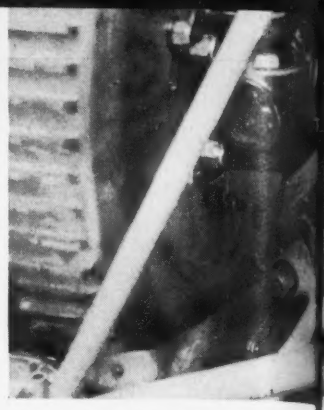
For those unfamiliar with Class G Modified racing, Lola is the latest English lightweight built around the Coventry Climax 1100 engine and, at this writing, the most successful. The particular one we met has yet to lose a race. In four times out, in the hands of owner Allan Ross, Lola has four wins.

The first day all we did was pry into Lola's innards with Owner Ross and Eric Broadley, her young English architect. As a spare-time sideline to designing buildings, Broadley last year built himself his own little Lotus-eater. Successful, he built another for a friend. Then another and another. So successful have they been, the building industry may have to wait awhile for Broadley's talents.

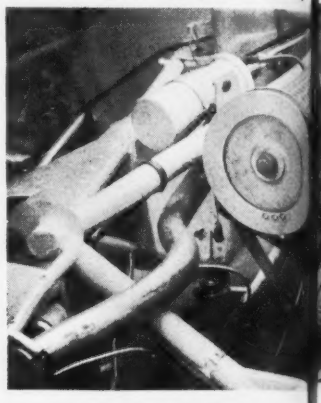
Typical of her class of car, Lola has a super-light space frame of welded tubing covered with a smooth aluminum skin whose configuration that looks like nothing so much as a miniature Scarab. Running gear, again typical, is a mixture of Triumph and BMC A-series parts, adapted and modified. The rear end is fully independent with its BMC center section modified to carry a pair of TR-3 10-inch Alfin brake drums inboard, machined down to 1¾ inches wide from 2½. Outboard are a pair of specially cast aluminum hub carriers. The special hubs connect the wheels to unsplined Hardy Spicer drive shafts with universal joints at each end. Location is by triangulated lower wishbones, the doubly U-jointed driveshaft and single trailing radius rods. The Armstrong coil-shock units are "pin-jointed" at both ends and do no locating. A very interesting part of this whole affair is that the rear end can be "tuned" or set for varying breakaway characteristics. Broadley calls them "slow" and "fast" tune. The method is sim-

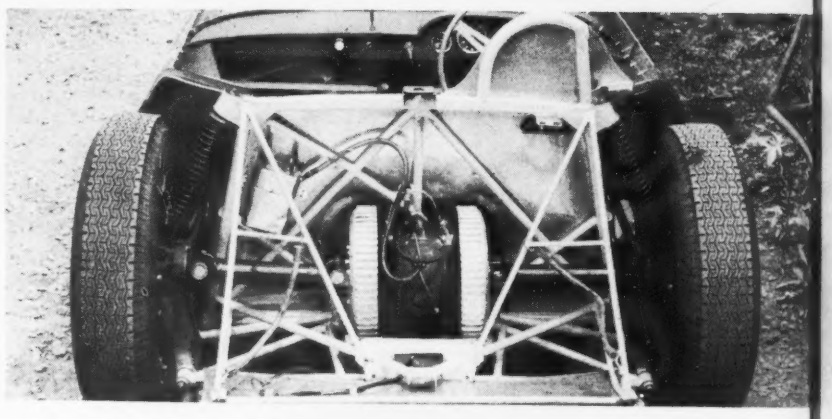
Right: Control arms are angled forward to handle most braking stresses. Below: Coming off the banking with 5000 rpm on the clock, Lola would touch 7200 by the middle of the front straight. This is tantamount to going from 90 mph to 130 in a quarter of a mile!



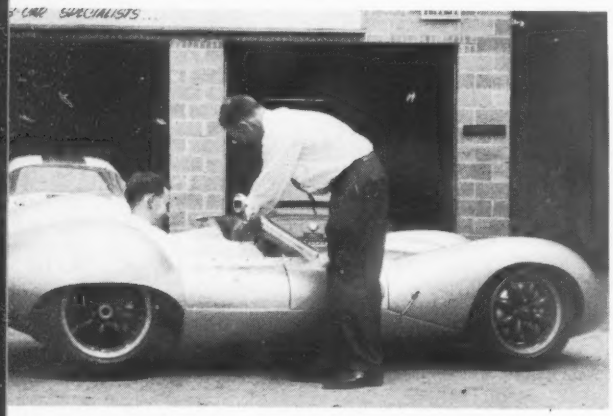


Above: End of A-arm is set in the slot that gives early breakaway.

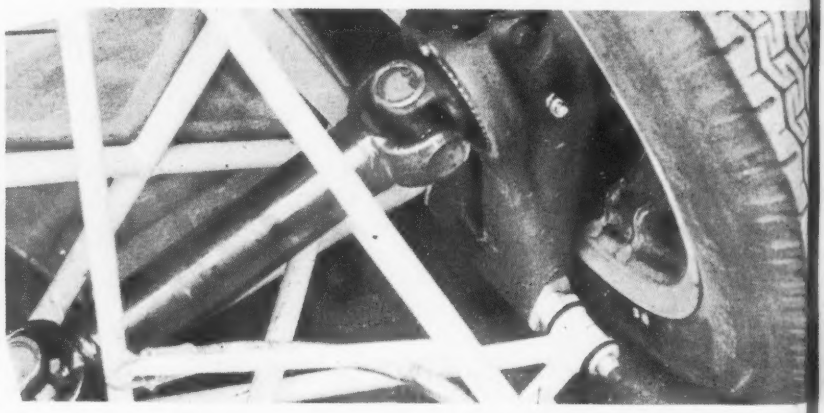




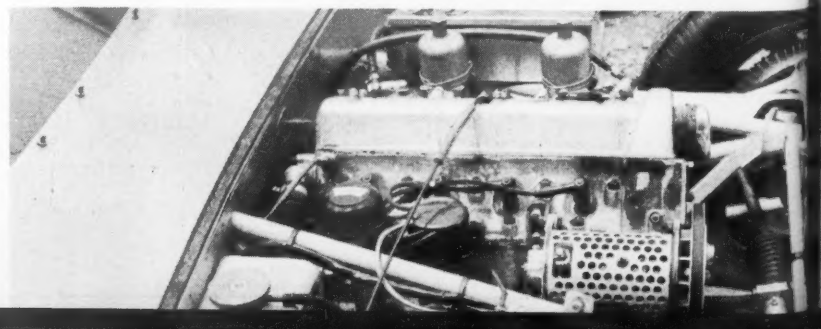
Right: Lola's undressed rear shows negative camber of back wheels. Angle is more acute when driver and fuel are loaded aboard. Lower right: Detail of outboard end of control arm and hub casting. Static camber setting can be changed by turning offset pin at bottom of hub.



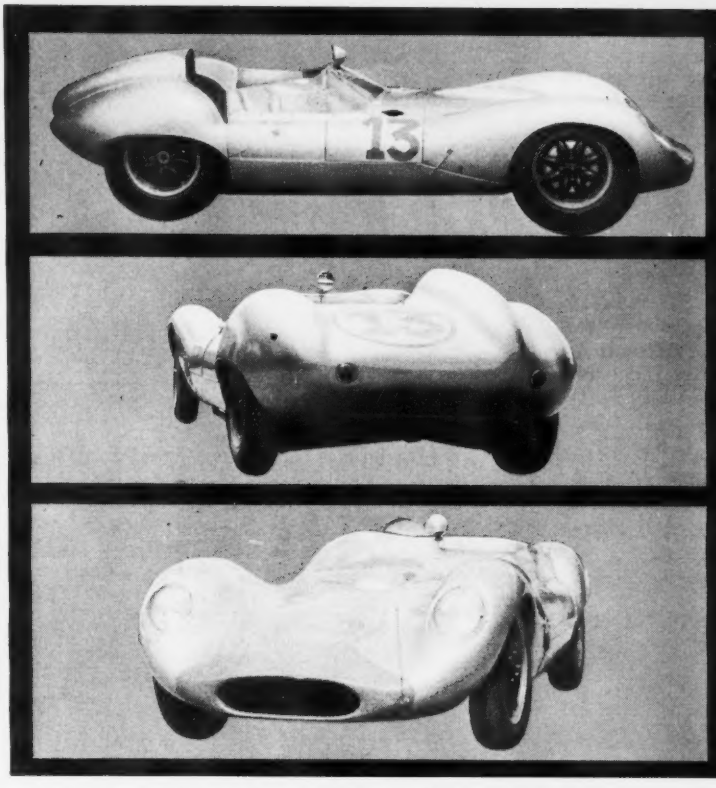
Above: Designer-builder Broadley shows new owner Allen Ross (right) how the competent Lola driver should fit.



Below: Engine compartment is full but not crowded in the FWA Climax-powered Lola. Broadley disapproved of the lightening holes in the generator case. His thought would have been to turn the case down to half thickness in a lathe. Neat idea.



max engine is canted 10 degrees the left for better balance.



LOLA Mk III

SPECIFICATIONS

POWER UNIT:

Coventry Climax FWA, Stage III	Four cylinder, water-cooled
Valve Operation	SOHC, valves in line
Bore & Stroke	2.85x2.62 in (72.4x6.66 mm)
Stroke/Bore ratio	0.92/1
Displacement	67.1 cu in (1098 cc)
Compression ratio	10.5/1
Carburetion	Two H-6 S.U.
Max. Power (advertised)	90 bhp @ 7200 rpm
Max. Torque (advertised)	72 lbs-ft @ 5250 rpm
Idle speed:	1500 rpm

DRIVE TRAIN:

Gearbox	MGA
Ratios: I	2.45
II	1.62
III	1.27
IV	1.00
Final Drive	3.73
Other ratios available. 4.22, 4.55, 4.88, 5.37	
Axle Torque taken by radius rods & wishbones	

CHASSIS:

Multi-tube frame, 1 in and ¾ in dia. 20 gauge	
Wheelbase	85 in
Tread, front and rear	48 in
Front Suspension	Unequal length tubular wishbones, coil springs
Rear Suspension	Independent, A-arms and radius rods, coil springs
Shock absorbers	concentric with springs
Steering type	rack and pinion
Turns, lock to lock	2.0
Brakes	Al-fin drum, rear brakes inboard
Lining area	167 square inches
Tire size	4.50/15 front, 5.00/15 rear

GENERAL:

Length	131½ inches
Height at cowl	23½ inches
Clearance	5 inches
Weight, dry	930 lbs.
Distribution, F/R	49/51 (with 160 lb. driver)
Fuel capacity	7 U.S. gallons

Photos: John Christy

ple in action, the inner mounts of the wishbones being moved up or down in a choice of three locations, up being fastest and down being slow. Broadley admits that he's never yet tried it in the fastest setting. Further control is gained by changing to springs with softer or harder rates, the softer the spring, the more "stiction" engendered. Ross's car had the stiffest springs and the low-slow setting since both he and Broadley felt that the faster settings are beneficial only on very high-speed corners. A car thus set-up would be too tricky for tight American courses. Even on the medium setting the car is said to hold until the driver is in far over his head, then letting go in a vicious spin unless extreme skill is exercised. In the slow setting, as we tried it, the car gave ample warning. This allowed cornering with the tail hung out a bit, an impossibility with the fast setting.

In contrast to the rear, the front suspension is perfectly straightforward, using unequal length tubular wishbones with a diagonally mounted coil-and-shock. Steering is by the familiar rack and pinion which gives two turns of the wheel from lock to lock. This item is a mixture of special and standard parts. It has a Morris Minor pinion with a special rack and housing. The track rods are also Morris. The brakes are again Triumph TR-3 Alfins, this time at their full 2½-inch width. Total lining area is 163 square inches. The bolt-on wheels are Cooper-built Elektron castings which carry 4.50 x 15 tires in front and 5.00 x 15 tires at the rear.

Originally, there were two fuel tanks, one on each side of the cowl. Ross, however, has removed the tank on the driver's side since one tank's seven U.S. gallons is sufficient for most American races. When endurance is required, the second tank will be remounted.

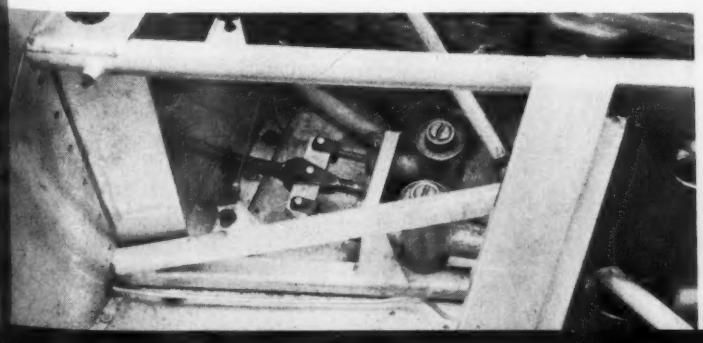
Power comes from the usual Coventry Climax 1098 cc engine that is virtually standard wear in this class. Carburetion on this particular "stage 3" engine is by a pair of single-choke 1½-inch SU instruments. The Lola doesn't need the extra poke to stay ahead of the Weber-carbureted Lotuses, Elvas and Coopers. When the extra power becomes necessary, it is there for the price of a pair of twin-choke Webers or SU's.

We arranged to meet the next day at Meadowdale to put the car through its paces. We arrived just as Allan finished warming up the car. He hopped out and motioned us in. This writer's posterior is by no means well-padded but even so the Lola's accommodations are tight. The seat belt felt almost superfluous so snug was the fit. This is all to the good since the driver is held perfectly in place no matter what sort of cornering is being done; there's no strain at all trying to maintain location on a hard turn or series of esses. The wood-rimmed steering wheel is almost vertical, set low, almost too low, and quite far forward requiring a Farina-like straight-arm technique. But in Lola this poses no problem since steering is so effortless.

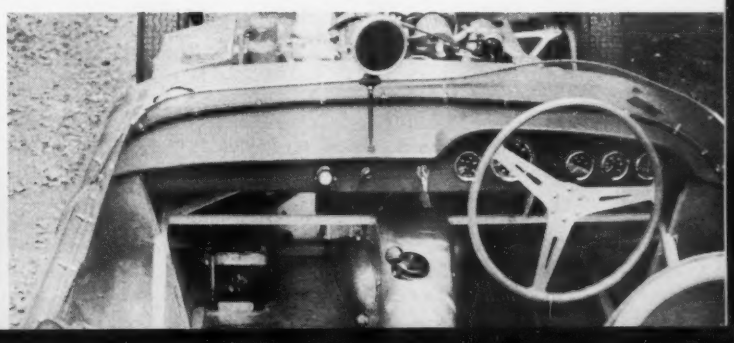
We set off for an exploratory lap and immediately fell in love with her. Handling was impeccable and friendly. There was a feeling that one would have to be a ham-handed idiot or do something terribly stupid to go very

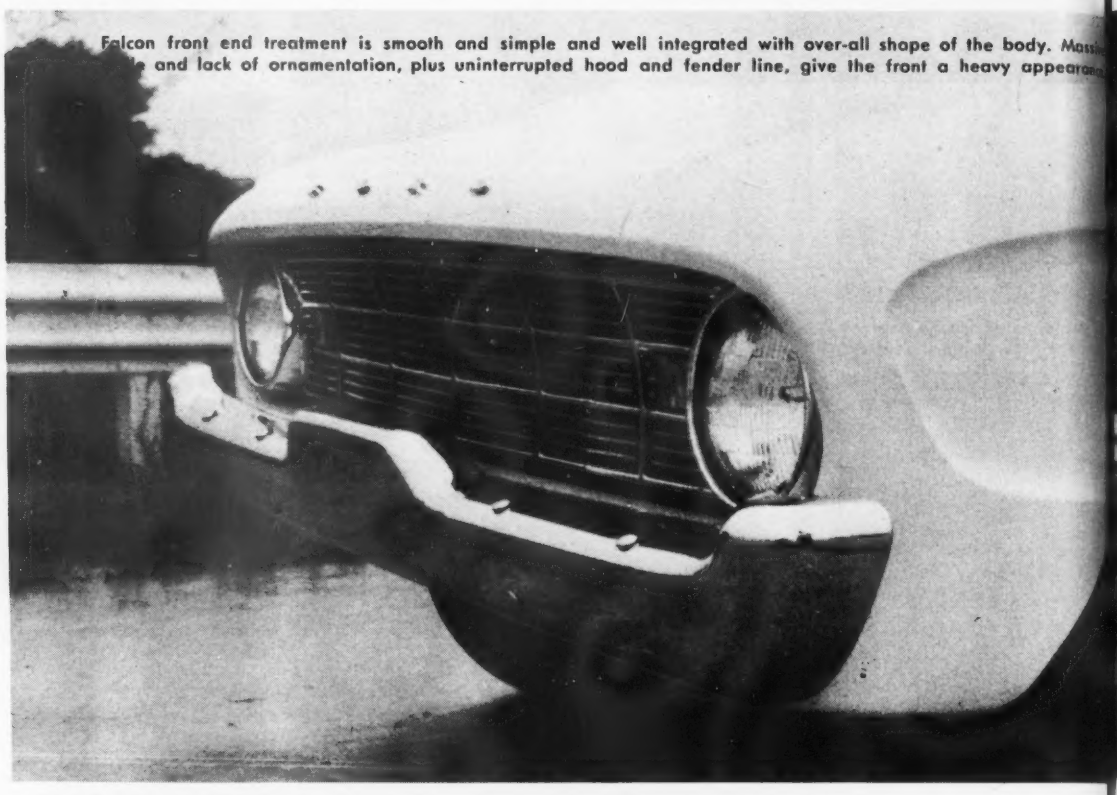
(Continued on page 77)

Below: Brakes are actuated by dual master cylinders. By changing position of center push rod more braking can be had at either end.



Below: Lola's cockpit is anything but plush. Layout is fairly comfortable, however. More knee room will be included later.

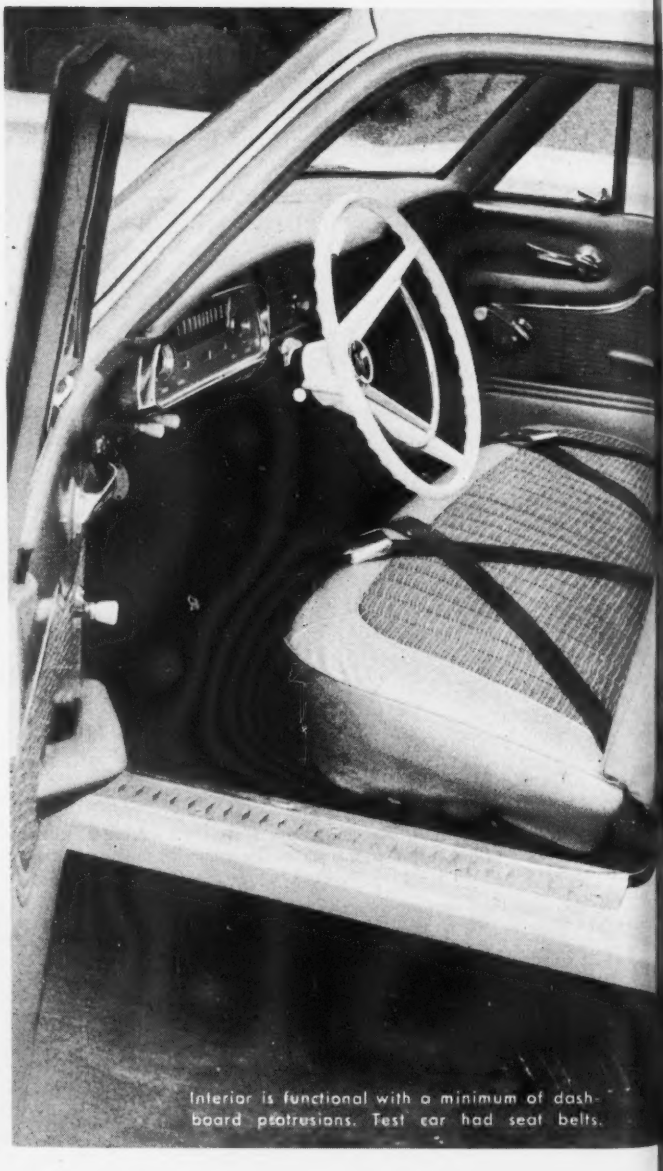




Falcon front end treatment is smooth and simple and well integrated with over-all shape of the body. Massi... and lack of ornamentation, plus uninterrupted hood and fender line, give the front a heavy appearan...

PRELIMINARY
ROAD TEST

FORD FALCON



Interior is functional with a minimum of dash-board protresions. Test car had seat belts.

The Falcon's lines are smooth if somewhat tubular in form. Sculpturing replaces chrome as side trim. Wide doors and high roof make car "livable".

▶ With the new Falcon, Ford has abandoned to a large degree the so-called "crisp" line although retaining a definite Ford "family" appearance. In so doing they have come up with the best looking Ford since the Thirties. Even painted white there is no feeling on the part of the viewer—or at least this viewer—that Fords and ice boxes could come from the same mold. In short, Ford's newest offering looks great.

If we cannot be as enthusiastic over the Falcon's performance as over its appearance, the reason is two-fold: the styling is good and it is not meant to be a race car. There once was a movie about a mythical automobile manufacturer whose motto was "comfort and safety for six with a Six". This could easily be Falcon's slogan as well, if they had thought of it first.

The Falcon program was begun with six definite objectives in mind. These were:

1. Light weight
2. Low cost
3. Full size (six passengers)
4. Low upkeep cost
5. Performance equivalent to the "normal" Ford Six
6. High economy of operation

How well have they succeeded in living up to these objectives? Except in item 5 above, very well indeed. With a shipping weight of only 2300 lbs and an engine weight of a mere 345 lbs. they have certainly succeeded in paring weight down, especially when one considers the size of the car. In European terms of reference the Falcon is not a *small* car. Across the ocean the Falcon would fit into the size category of such items as Simca's Vedette, Mercedes' 190 and Rootes' Humber. None of these are considered small but rather "medium" in size. Thus the Falcon's weight is indeed light.

In terms of low first cost, though no hard and fast price has at this writing been set, the target of "around $2,000" is certainly competitive with cars of this size and configuration. The chances are very good that the announced price will be under the target figure when it is finally set.

Item 3 has been met with a will. The interior of the Falcon is in some ways even more roomy than other cars in the Ford line. According to the Ford people the Falcon interior was built to accommodate the above average man, five feet 10 inches tall and weighing 160 lbs with adjustments built in to accommodate taller and shorter people. Further the design aim was to provide room for five other similar-sized passengers as well as the driver. Just to see if they had succeeded in this we packed in one less than a full complement with added test in that all of us were different sizes and shapes. This writer is five feet, eight, weighing about 135. Dick Judy of Ford's P.R. staff is a good six feet, four and lanky. Colleague Emmet Greene is five-six and chunky. SCI's Detroit Editor, Mike Davis is six feet even and stocky. We commandeered one of Ford's test drivers, a man of about five feet ten inches and 180 or so pounds to make up the fifth. All of us fitted with room to spare and each of us could adjust the driver's seat to fit our individual requirements, a wide variation indeed.

In the matter of low upkeep we can only be subjective and make an educated guess based on accessibility of the various components. Maintenance should be ridiculously simple when compared to the normal variety of Detroit cars which would bring labor costs in service and repair to a minimum. Nothing is tucked away and nothing is covered by tin shrouds. There are no big power assist units to get in the way. From what we could see the engine could easily be lifted out without stripping anything but the hood lid. Labor time being the major item in service these days it is easy to predict that service costs will be cut by a good third on the Falcon.

Now we come to Item 5, that dealing with performance. The aim was to give the car the performance of the normal-sized Ford Six. Subjectively and objectively they have missed by a good margin. They can be excused on this point for the good and sufficient reason that the target set was terribly high. The standard Ford Six is a gutty powerplant that will, in its latest form, push a normal sized Ford along at a pace that was considered good for a V8 a couple of years ago. It will do zero to 60 with automatic drive in something around 15 seconds or a good 10 seconds less than it takes the Falcon to reach that figure. It will move at a top speed in the high 90's where the Falcon labors mightily to produce a shade over a true 80. This, of course, applies to the two-speed Fordomatic equipped Falcon we tried. The factory test crew claim that the standard shift is quicker, getting to 60 in the neighborhood of 19 seconds.

One very definite fact was brought out in our test and that is that the two-speed automatic is *not* the transmission to be coupled with an engine of only 144 cubic inches. That amount of volume just cannot produce the torque necessary to move a 2300 lb car through only two gears even with the hydraulic assist of a torque converter. The subjective effect is that the car has nothing at the bottom end of the speed scale, a good bit of pull in the middle and then nothing at the top end.

The lack of top end, as seen from the big chunk of time it took to go from 50 to 70—23 seconds—could probably be pegged to the fact that this engine is designed for economy and suffers breathing problems near its peak rpm. Also, the singularly mild, tractor-like cam timing of 232 degrees duration is no help. But the lack of performance at the low end of the scale

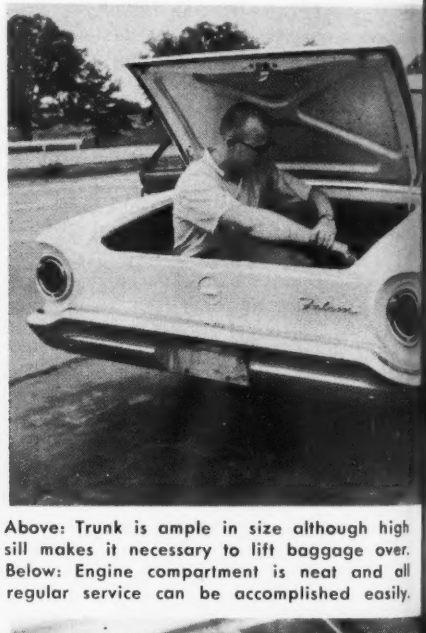
can be blamed directly on the overly high (low numerical) gearing. Held in low gear, the Falcon will, when wound out, do a true 60 miles an hour which is an indication of the high ratio used to move it off the mark. Driving through a 3.10 to 1 axle, which is extremely high for a car of this size, is the two-speed automatic which produces in low range only a factor of 1.75 to 1. Standard practice on European cars of similar size is a rear end ratio of 4.11 to 4.55 and higher with a three or four speed gearbox with a lowest ratio of around 3 or 3.5 to 1. Thus, in comparison, the Falcon with Fordomatic is hamstrung at the stoplight. It will probably cruise comfortably all day long at 60 miles an hour but it is certainly no race car.

While we had no opportunity to get an accurate mileage test we can easily believe the Ford test crew's claim of mileage in the middle 20-plus mpg range for the standard shift equipped Falcon and two or three miles per gallon less in the Fordomatic equipped version. Under stop and go conditions, due to the problems outlined in the preceding paragraphs and consequent tendency to mash hard on the throttle it is likely that the automatic shift Falcon would suffer more than a mere two or three mpg in our humble estimation. However, to a man used to the gas gobbling propensities of the larger or even "low priced three" Detroit cars the mileage handed out by either version of the Falcon would come as a welcome surprise, especially on a trip wherein much of the travel was done on throughways or freeways.

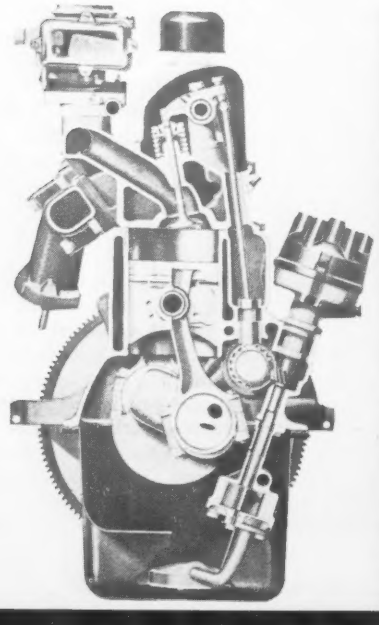
In several departments the Falcon is outstanding. One of these is brakes. During our ten-stop test we got all kinds of horrible smells from hot linings but very little fade in comparison to most American cars in which about four hard stops leave the machine utterly brakeless. The first three stops with the Falcon gave a steady reading of eight tenths G, the next two produced seven tenths, the next four were around 6.5 tenths and the final one came back up to seven tenths again. The only drawback was a tendency toward alternate lock-up—each of the four wheels locking solidly at one point or another. The brakes that produce this no-fade stopping are not large by any standards being 9-inches in diameter all around, 2.25-inches wide at the front and 1.5-inches wide at the rear with a total effective lining area of 114.3 square inches. Effectiveness percentage is 63 percent at the front and 37 percent at the rear.

Another nice point is handling. True, this is no sports car and it doesn't give the effect of pancake-flat cornering but it does stick and the steering is light and, for a domestic product, quick or at least it feels so despite a lock to lock 4.64 turns. Taken

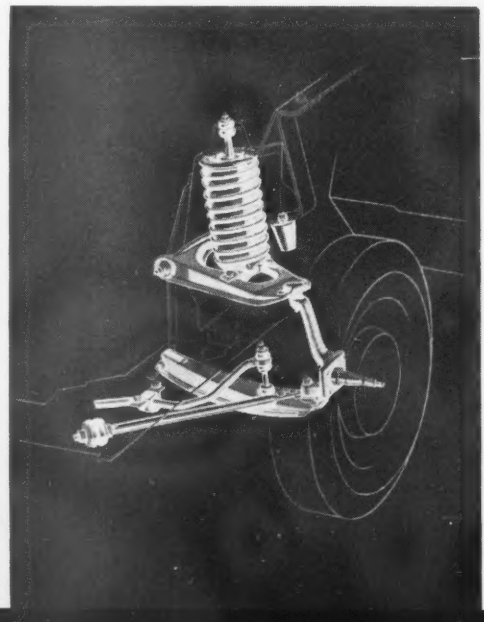
Above: Dashboard consists of 100 mph speedometer, a multitude of knobs and warning lights. Below: Front suspension detail showing normal upper wishbone, single lower arm with locating rod.

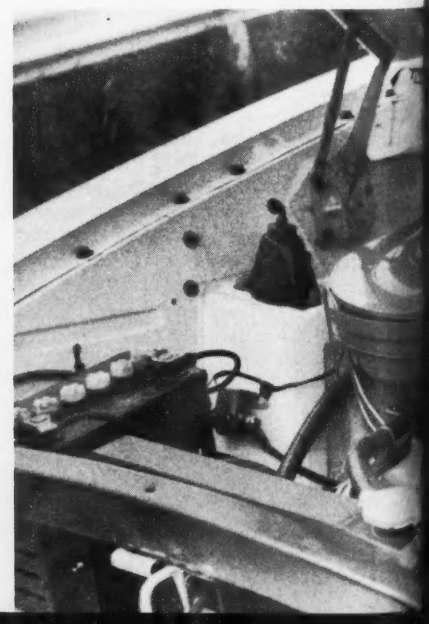


Above: Trunk is ample in size although high sill makes it necessary to lift baggage over. Below: Engine compartment is neat and all regular service can be accomplished easily.



Below: Straight-six engine is normal in design being similar to the engine in the English Ford Zephyr and Zodiac models.





at full tilt over Ford's twisting proving grounds (a *great* road course Mr. Ford) the effect was not at all unnerving as it can be in larger or less handy equipment.

There are reasons for this, too. For one thing the Falcon is a true unit body construction and is torsionally rigid to a high degree. Consequently one doesn't feel that the frame is bending thataway while the body is attempting to go thisaway on a bumpy, twisty circuit.

Naturally, one can't just point at one item of engineering and say *"that's* why the car corners well" or some such statement and let it go at that. But one factor in the Falcon's handling is certainly the new front end layout—at least it is new for Ford though slightly reminiscent of the Willys in its later years. In this unit there is a fairly normal upper A-arm or wishbone and there normality in its accepted sense stops. The lower control arm is a single, deep hat section stamping located laterally by a diagonally placed trailing torsion arm. Springing is, as one might suspect, by coil, but the coil acts on the upper A-arm rather than on the lower arm which is where the Willys part comes in. The whole result is a neat, light effective unit that does a job excellently.

All things considered, Ford has taken the opposite tack from its major competitor and produced an absolutely normal compact car and in so doing have come up with something quite new. While there are no innovations on the Falcon as such the total effect is, for this era in Detroit, novel and effective, probably as effective in its way as the completely new and innovation-bristling product of the competition.

A public relations man representing a well-made and popular foreign sedan took one look at a side view of the car, shook his head and said: "It'll sell." We have very little doubt that he's right.

—jpc

PERFORMANCE

TOP SPEED:

Two-way average .....84 mph

ACCELERATION:

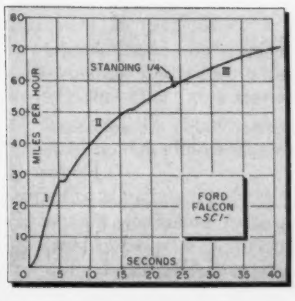
From zero to	seconds
30 mph	6.7
40 mph	10.3
50 mph	15.8
60 mph	25.1
70 mph	39.0
Standing ¼ mile	23.9
Speed at end of quarter	59 mph

SPEED RANGES IN GEARS:

I	0-28
II	4-51
III	7-top

SPEEDOMETER CORRECTION:

Indicated Speed	Timed Speed
30	30
40	39
50	48
60	57
70	67



POWER UNIT:

Six cylinder, in-line, water-cooled engine
Valve Operation ...pushrod, in-line ohv
Bore & Stroke .....3.50 x 2.50 in (88.9 x 63.5 mm)
Stroke/Bore Ratio 0.71/1
Displacement .....144.3 cu in (2365 cc)
Compression Ratio 8.7/1
Carburetion by..Holley 1 7/16 single barrel
Max. Power .....90 bhp @ 4200 rpm
Max. Torque ....138 lbs-ft @ 2000 rpm
Idle Speed .....520 rpm

DRIVE TRAIN:

Trans. ratios	overall	Auto. ratio
I	3.29	10.20 (1.75-4.20)
II	1.75	5.43 (1.00-2.40)
III	1.00	3.10

Final drive ratio ..3.10..(3.56 optional)
Axle torque taken by rear springs

CHASSIS:

Integral body-frame construction
Wheelbase .....109½ in
Tread, front and rear .....55, 54½ in
Front Suspension ...Unequal wishbones, high coil spring location
Rear Suspension .....Rigid axle, longitudinal semi-elliptic leaf springs
Shock absorbers ...1 3/16 in dia telescopic
Steering type ..recirculating ball & nut
Steering wheel turns L to L 4.64
Turning diameter, curb to curb ..37.7 ft
Brakes .....9 in drums, duo-servo
Brake lining area .....114 sq in
Tire size .....6.00 x 13

GENERAL:

Length .....181 in
Width .....70 in
Height .....54½ in
Weight, curb .....2395 lbs
Weight, as tested .....2695 lbs
Weight distribution, F/R as tested 53.3/46.7
Fuel capacity .....14 U.S. gallons

RATING FACTORS:

Specific Power Output ....0.62 bhp/cu in
Power to Weight Ratio, as tested .....30.0 lbs/hp
Piston speed @ 60 mph ....1160 ft/min
Braking Area .....84.8 sq in/ton
Speed @ 1000 rpm in top gear..21.6 mph

an owner's eye view of the HERALD

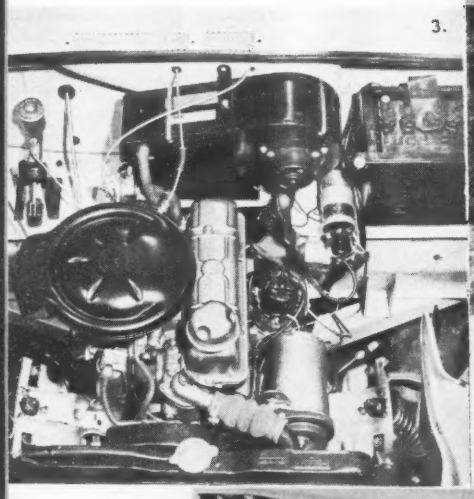
by Gil Dawson with Dennis May

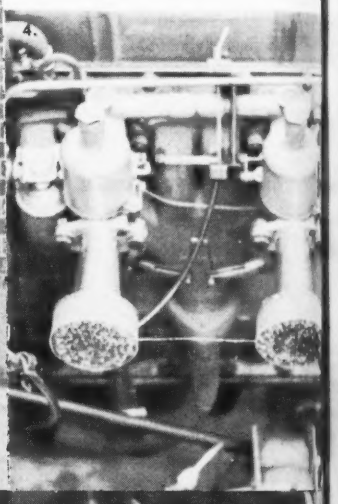
1. New Triumph Herald coupe.

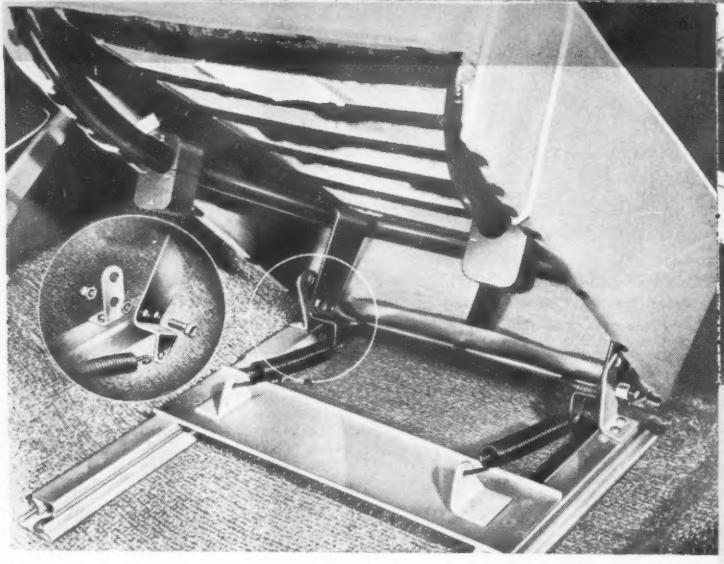
2. One way of incorporating bumper guards on a small car.

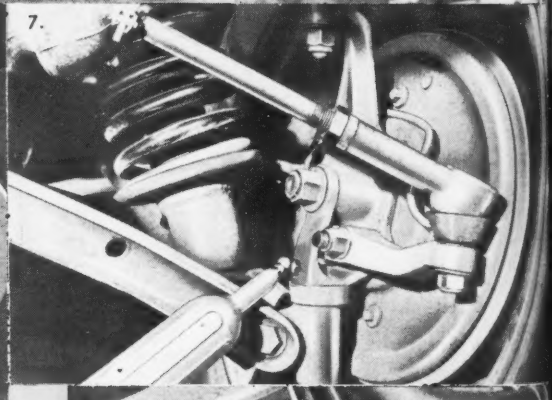
3. The entire front end of the Herald tips up to expose the engine. Accessibility for an owner/tinker couldn't be

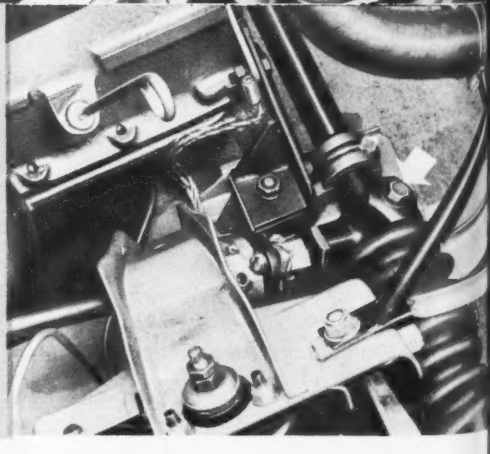
4. One modification made on the author's Herald was removal of large air cleaner. It was replaced by rampipes and twin air filters.











5. Layout of dashboard on right-hand drive Herald. Plastic junk basket is an interesting idea.

6. Seats on coupe are adjustable for height by turning numbered blocks.

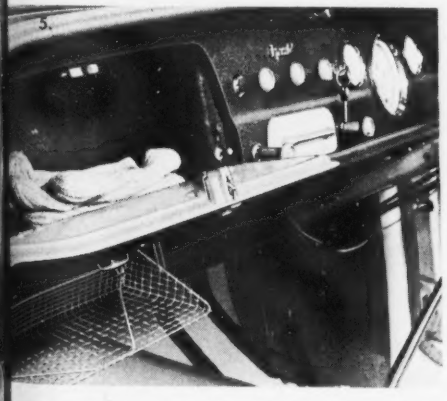
7. Oil gun is leveled at one of the few greasing points on the Herald — the steering pivot.

8. Arrowed plug is filler for steering box.

▶ A honeymoon doesn't put enough mileage on a marriage to exhaust the process of mutual revelation, and it's the same with motoring. You have to set up housekeeping with a car—rather than just borrowing it briefly, as a professional press tester ordinarily does—to find out whether disillusion or lasting affection will likely succeed nuptial ardor. These notes, then, represent an owner's-eye-view of the Triumph Herald coupe. Carrying chassis number Y52, my car was one of the earliest deliveries on the British market. Its mileage at this writing is just coming up to 4000.

The two-model Herald range, a sedan and a hardtop coupe with space for extra baggage or a child's seat behind the driving compartment, was launched in the U.K. last April. Features common to both types are nonintegral chassis with independent suspension all around—swing axles and a transverse leaf spring in back, wishbones and coils in front; Michelotti styled bodies consisting of ten welded-up subassemblies, designed for cheap and easy replacement in the event of crash damage; a minimal servicing commitment, with wholesale elimination of greasing points; Triumph's time tested 57.80 cu in (948 cc) 4-cylinder engine with pushrod ohv; 4-speed transmission with remote control by a short central shift lever, synchromesh on the three upper ratios. With dual sidedraft SU carbureters, 8.5/1 compression and a hotter camshaft than the sedan version, the coupe's engine develops 50.5 gross bhp at 6000 rpm.

Going the Rolls one better in postural



permutations, the Herald has three-way seat adjustment — horizontal, vertical and back slope — plus a telescopic steering column; this combination caters for drivers of 48 different gauges. If, like me, you happen to have a 49-gauge physique, meaning you can't get quite far enough away from the wheel to be mistaken for Dr. G. Farina, here's the solution: file the rear stops off the seat runners, cut two or three extra notches in them. The heads of the bolts holding the back ends of the base runners to the floor will then act as rear stops. This dodge extends the seat travel by about 2 inches.

An adjustable steering column is an unusual refinement in the Herald's price class, and creates a precedent it's to be hoped other mass producers will copy. But this interpretation, unlike the Bluemel mechanism fitted to more expensive British makes, admittedly can't be reset without using tools; tools that unfortunately don't all come with the car. Contrary to the impression some press reports have given, shifting the steering wheel is a triple operation, involving slackening and retightening two attachments of the outer column sleeve to the dash framework, apart from undoing and retightening two bolts on the split clamp that is the actual crux of the device. These bolts have to be tightened to a specific torque figure, but the Owner's Handbook doesn't name it. But it is stated, I believe, in the more sophisticated Owner's Repair Manual, which is sold rather than given away. Overtightening would defeat the secondary object of the adjustable column, namely, telescoping under impact in a collision.

Whatever its position within its range of telescopic travel, the rigid two-spoke wheel is way below the driver's line of sight—another credit item in the visibility ledger. I only have one fault to find with this wheel: its spokes have rather hideous stippled cappings, which, at night, throw reflections from the instrument lighting onto the screen. Something else that isn't too easy on the eyes is the turn indicator monitor light, which has at least twice the candlepower it needs.

The instruments themselves, pointing up the current British trend away from imbecilely "artistic" dialcraft, are circular, three in number (speedometer with mph and kph calibrations, fuel gauge, water thermometer) and perfectly placed. There is no tachometer but, by a coincidence, speedo readings in third gear can be instantly translated into approximate rpm figures; 10 mph being equivalent to 1020 rpm on this ratio (6.62/1), it's easy to remember that 20 mph roughly equals 2000 revs, and so on up the scale to 60 per hour, when of course you are slightly, but not culpably, exceeding the 6000 rpm at which the power curve peaks.

My own Herald, incidentally, easily reaches an indicated 63 mph in third on the level, except when the throttle cable indulges in a habit it sometimes has of going out of adjustment and wasting the last few degrees of butterfly travel. This throttle wire seems very liable to stretch, and the method of taking up slack, using a thimble and grubscrew, would make the late M. Vernier turn in his grave. Part of the fault may lie with the cable return spring, which works in compression and appears to become coilbound when the throttle nears the fully open position. It shouldn't be hard to devise a homely mod, substituting a spring that pulls instead of pushing.

To date, efforts to improve engine performance haven't gone any further than tentative carb tuning of a nature and scope that isn't worth detailing; also, the standard air cleaner, an enormous tin beret of formidable weight, has been ditched and replaced by a pair of bellmouth ram pipes of a pattern marketed for SUs in Britain and elsewhere. Not having the heart to run on open intakes, I made up a pair of small muffin type cleaner bodies from perforated zinc and filled them with steel wool extracted from the original cleaner *cum* silencer. Banishment of the latter anyway improves general accessibility under the hood, even if the freer airflow doesn't do any good carburetionwise.

In this connection it's a fair guess that Triumph were influenced in favor of a separate chassis and body, rather than integral construction, partly by considerations of engine accessibility. In the fashion adopted by Aston Martin and many competition cars, the whole forepart of the body hinges forward for servicing and maintenance operations, and an untold boon this is to an amateur mechanic, or a professional one for that matter. There isn't anything you can't get at, forward of the firewall, as easy as if it were laid out on a bench.

A fool for oil hygiene, I've used a magnetic sump dipstick *and* magnetic drainplugs in the engine, gearbox and back axle from the day the car was delivered. The trouble with these traps is you don't know whether to hope they will or won't make a catch; if they don't you've wasted what they cost, and if they do you worry about the wear your little harvest of ferrous particles represents. In my case, all the magnets have grown whiskers that are visible to the naked eye without being alarming.

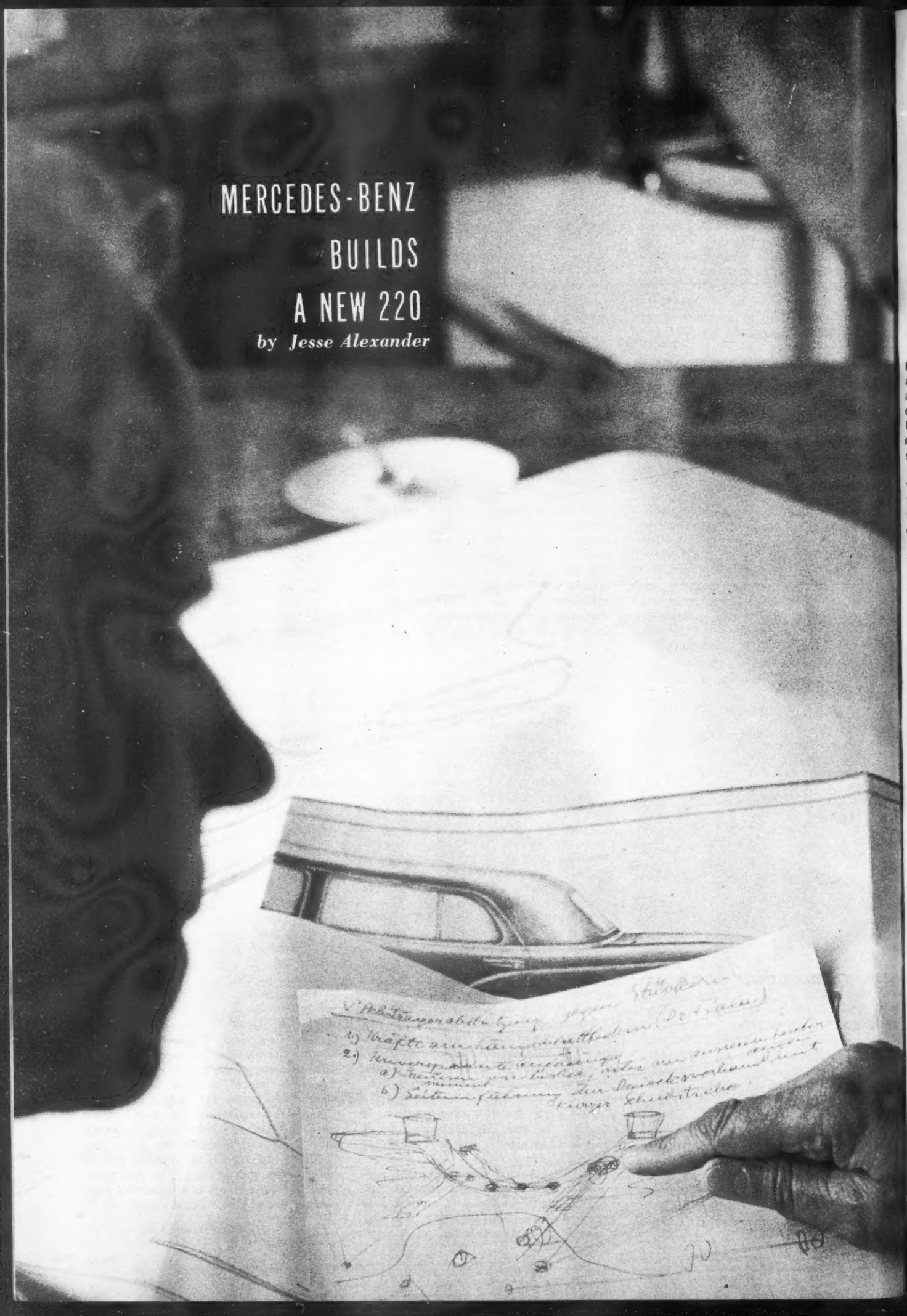
Talk of dipsticks brings up a maintenance point. The handbook says to "check and, if necessary, top up the oil level" of the gearbox and back axle every 6000 miles. Fine, but as neither gearbox nor axle has a dipstick, the only way of finding out whether topups are necessary is to top up. The filler hole in each case being horizontal, moreover, you can't make even these exploratory replenishments without using an oil gun. They don't give away a gun with the car.

The above isn't so much a gripe about the car, which sets a unique standard for overall ease of maintenance, as of euphemism in the makers' manual which is typical of such literature the world over. There are some misconceptions to correct, too, under the head of chassis lubrication, though these aren't Triumph's fault. One leading British car magazine, for instance, said "greasing points have been eliminated from the chassis", another asserted there were "no grease-gun nipples". These statements were doubtlessly made in good faith but the first was untrue and the second was only true in the sense that Triumph doesn't *supply* nipples; they're nevertheless indispensable, as the handbook not only states but illustrates with photos. Every 6000 miles it's necessary to

(Continued on page 74)

MERCEDES-BENZ BUILDS A NEW 220

by Jesse Alexander



Photos: Jesse Alexander Julius Weitmann

▶ In August, a new star appeared but no astronomers noticed. No wonder, for it appeared, not in the heavens, but at the end of Daimler-Benz's Sindelfingen assembly line. Under it glistened the striking shape of the new Mercedes-Benz 220 sedan.

At first, only two per day edged their way into Sindelfingen's sunshine, but as workers became used to the new cars, the rate gradually increased. The ever-alert quality-control inspectors were more than unusually careful, but before long the parking areas around the huge assembly buildings became crowded. When it seemed they could hold no more, that the hidden mass of still-secret cars would run over into the cobblestone streets, the valve was opened and trucks and trailers and trains came from all over Germany to carry the new model away, to be delivered to dealers' showrooms all over the world.

This was the end of Chapter One in the story of the new 220. Public acceptance and economic prosperity will dictate the second in the months to come, but since model changes at Daimler-Benz are so infrequent, the how and why of the 220 change is worthy of our study.

The story of the new 220 begins at the desk of Professor Nallinger, Daimler-Benz's chief engineer, in 1956—a year after the 220A had appeared. Though the 220S had just been introduced and its fuel injection sister the 220E was still two years in the offing, Prof. Nallinger wanted to discuss the "new 220". Present were Wilfert (styling), Uhlenhaut (passenger cars) and Mueller (engines).

Nallinger had drawn up fixed requirements only for certain interior dimensions, leaving everything else open for discussion except the target date (Autumn, 1959) and that it was to be a continuation of the 220 series, whose three models shared the same basic engine, chassis and body-shell. (The least expensive 219 had a shorter wheelbase and only one carburetor compared to the 220S's two and the 220SE's fuel injection system. Upholstery and trim were varied in keeping with the performance.)

The 220 series is probably the most popular of all Mercedes sedans, combining performance and luxury in a compact package the had no direct competition. When these four men got together and put their thinking caps on, they know they were responsible for millions of Deutschmarks and the well-being of both Daimler-Benz AG and its many employees.

Wilfert certainly had the largest job, for nothing becomes obsolete as quickly as body design, not even when it is carefully planned to be "conservatively modern" from the outset.

Changes on the surface meant changes underneath, so Uhlenhaut was also sure to be busy, especially since he had several ideas left over from his W196 Grand Prix and 300SLR sports car experience which were just waiting for a chance to be used on a passenger car.

Mueller, with his engines, had a less immediate task before him. The 220 series' engine was (and is) far from played out, so he was only called on to continue his program of development and improvement of the sturdy single overhead camshaft six.

Wilfert's Styling Department is small compared to an American factory's. Less than 50 men, including model-makers, draughtsmen, painters, carpenters and even a scientist, work under this greying, immaculate and suave Austrian who has been with Mercedes for over 25 years.

Styling suggestions began under his direction with huge full-scale line drawings. Exterior contours were not rushed instantly to paper, however, for considerable thought goes into the use of space. How long should the car be? How much wheelbase? How high? How heavy? All factors must be considered before decisions are made.

Each suggestion stimulated discussion which in turn led to further suggestions. There were innumerable meetings between the top four and amongst their staffs. By 1957, in cooperation with the other groups, Wilfert's crew had worked up a styling solution that met with everyone's approval, including Professor Nallinger's.

An abrupt critic might say merely that the classic 220 had been Americanized—it was now five inches longer, half as much wider and two inches lower. The difference lies in that the "larger on the outside" dimensions have been exploited to provide more room on the inside, 50% more in the case of the trunk.

In line, the new body is distinguished by the extensive use of glass. The curved panoramic windshield provides great visibility without the distortion inevitable with extreme wrap-around.

At the very front, the modern version of the traditional Mercedes-Benz radiator grille (reminiscent of Italian treatment of this difficult problem) is set off by headlight-foglight-turn indicator units off the 300SL roadster. The latter lead into straight-through fenders which terminate in modest fins. The taillights are below and inboard, just below the trunk lid.

Inside the new body-shell, many features of the older 220 series are continued; most noteworthy is that the combination of front suspension, engine and transmission are attached to a sub-frame which is rubber-mounted to the unitized body-frame, keeping engine and road vibrations away from the passengers. Even so, there are changes. The front shock absorbers are moved closer to the wheels to increase their effectiveness and both the sub-frame and the side members of the floor-frame are strengthened to increase passenger safety.

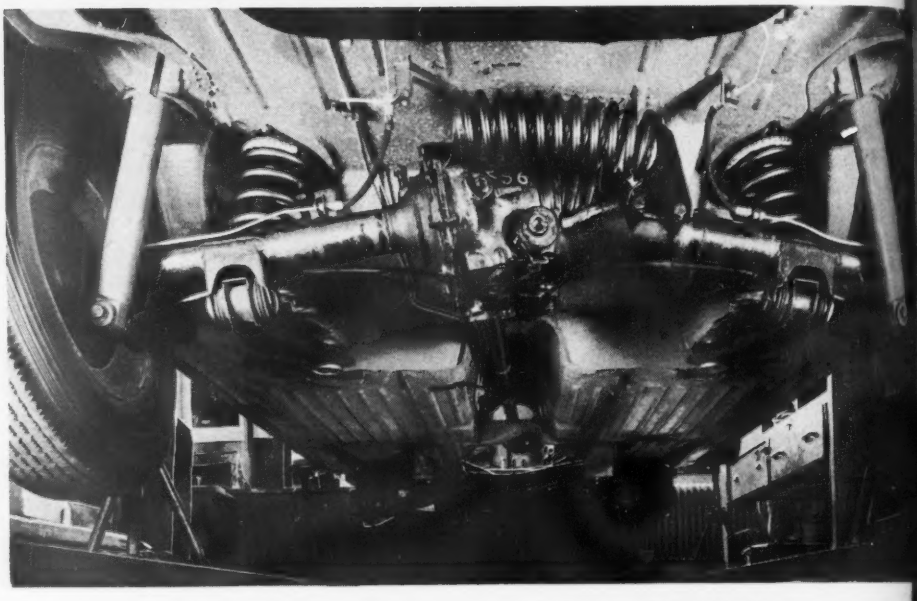
As before, there are three models in the 220 series (the 220, the 220S and the 220SE) which vary in power output (105 @ 5000, 124 @ 5200 and 143 bhp @ 5000 rpm) as well as in trim and upholstery (nice, nicer and nicest).

This time all three models are on a 108-inch wheelbase, the same as used before on the short 219. As well as simplifying production, this 2.7-inch decrease saves weight (to make up for the increased use of glass, which is heavier than the steel it replaces) and to increase torsional rigidity. While ride comfort is usually better with a longer distance between the wheels, it was decided that Rudolph Uhlenhaut would have to make up the difference in the suspension—without letting the 220's highly regarded handling suffer. This, as we shall see, he more than managed.

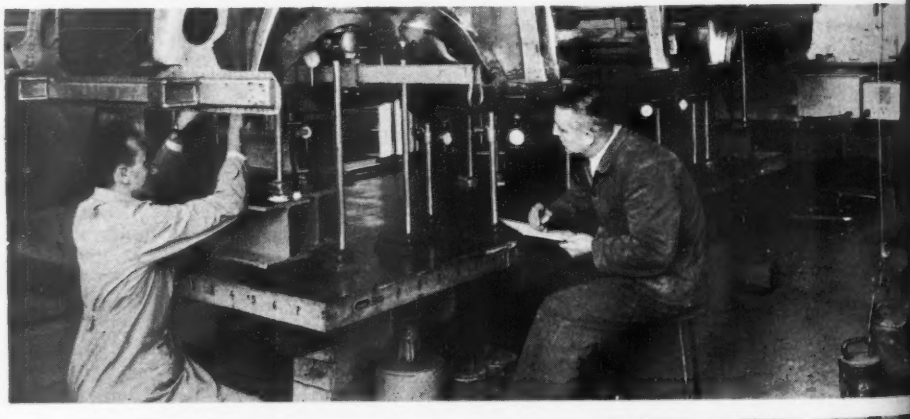
The transition from a "styling solution" on paper to one in three dimensions isn't easy. It takes time and patience. First, a one-tenth scale model, then a full-size one are made in clay. Next a wooden buck is painstakingly put together and covered with plaster. Its body panels, doors and roof are dummies, but the bumpers, wheels, tires, seats and windows are real. Once painted, this full-scale mock-up can be subjected to the critical stare of the photographer's lens. Photographs are taken from every angle and projected onto a screen for engineers and designers to scrutinize. If they aren't satisfied, work stops and changes are tried until they are. Then work rushes on, for a schedule has been laid down and it must be kept to.

Special hydraulic seat was built to enable driver to stand 8 hour long stretches on rough-road section of M-B proving grounds.

Left: This is the rough road test track used for extreme use testing of running gear and suspensions. Below: New 220 rear suspension incorporates coil compensating spring borrowed from the 300 SL.



Below: Basic chassis structure undergoes stress tests. Unit stands on steel-topped table supported by metal legs incorporating strain gauges. Weights on arms apply load.



The interior of the car is explored as vigorously as the outside. A tremendous effort went into making these very fast cars safe for the passengers inside. Not just a superficial effort at splashing a bit of sponge rubber around, but a serious, thoughtful plan to make everything in sight (and out) as least harmful to the human form as feasible.

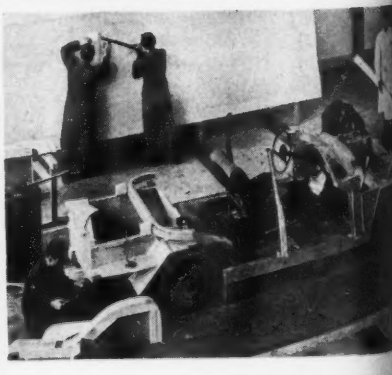
A scientist in Wilfert's section devoted his entire schedule to this program. Dummy heads was bashed against dashboard mock-ups to measure the forces. The windshield is designed to pop-out under a sudden blow. The rear-view mirror, an oft-forgotten hazard, is designed to come off its mounting rather than break up into dangerous fragments. After much study, the steering wheel is kept flat, but the horn button is surrounded by a large ring of padding This will give better protection than the deep-dish American-style, he decides, because of the greater area for impact.

To stop accidents before they get started, the speedometer is arranged vertically. German traffic experts are already applauding this innovation for its phychological advantages. They feel it gives the unconscious a warning of danger as speed rises. (Tech. Ed note: We might criticize it from the simple point that round dials with indicators that rotate are easier to read than any device with purely linear motion.)

For comfort, the heating and ventilating system is further explored. From the 300SL coupes is taken the idea of ventilation slots. This time they are placed in the rear window-posts, enabling the fresh-air intake to function without opening any windows.

Now that interior details as well have been finally set, the tool and die makers are called in. An "original model" is made of close-grained mahogany, from which are made dies for body pressings.

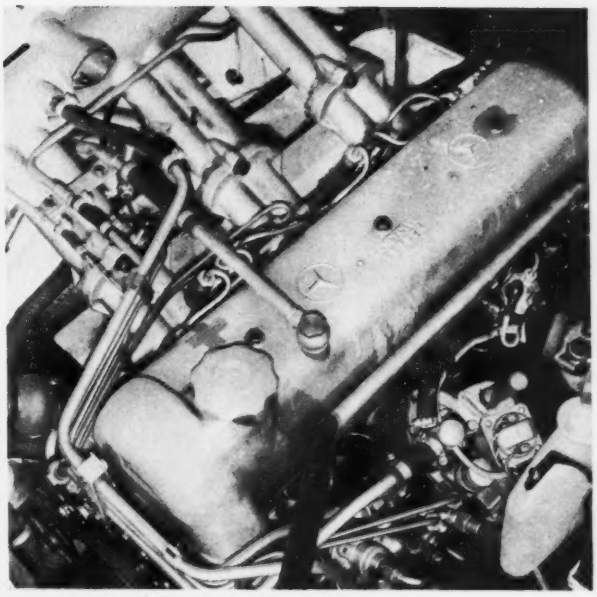
Uhlenhaut has been working out his suspension, brake and steering ideas on older cars which he has modified in various ways. By this time, he is quite sure what he wants to do (and what the financial wizards will let him do). Disc brakes have been tried and set aside, the front suspension is hardly changed, but the low-pivot swing-axle rear end gets a big change with the introduction of the 300SL road-



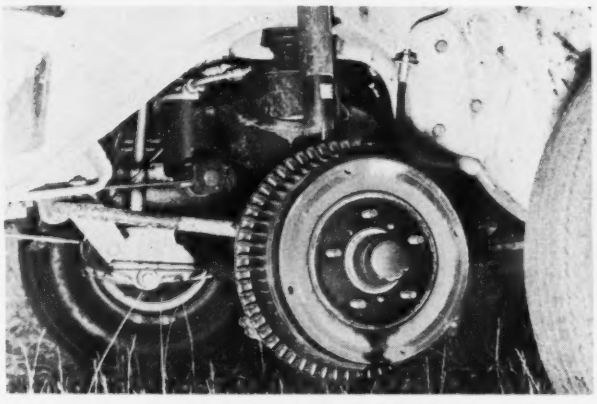
Left: New lights are fitted to full-sc... plaster model. Above: Wood buck for pla... car is equipped with wheels, seats and gl...

Above: Plywood templates are used to get right contours in thick plaster covering.

Below: Lights attached to body and wheels trace straight and wiggly lines on photo taken at night to test suspension's ability to cushion body and passengers from jolts.

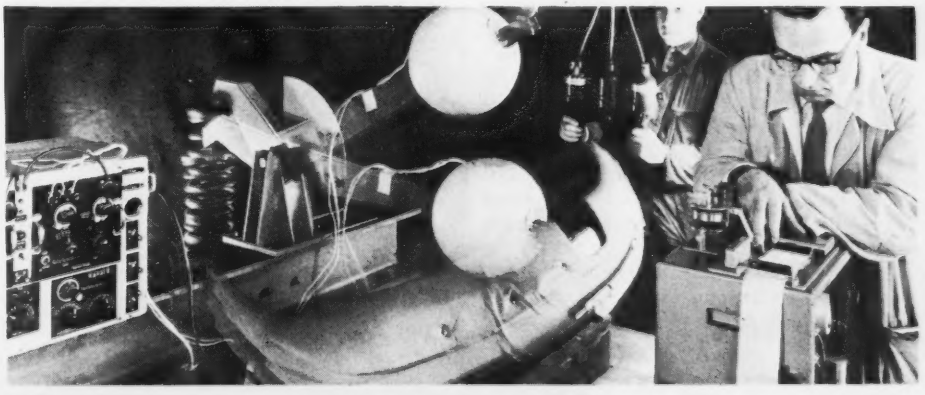


Above: New 220SE fuel injection engine has straight induction pipes. It produces 143 hp. and has a much flatter torque curve.

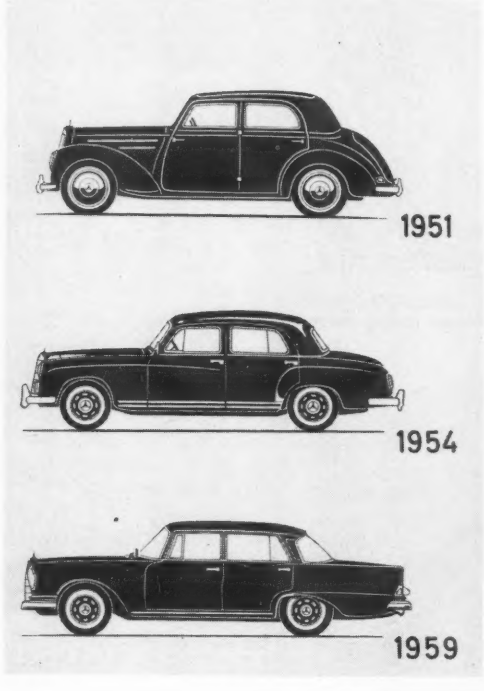


Above: Redesigned front suspension has the shock absorbers moved outward nearer the wheels. Mounting of the complete front end to a rubber cushioned sub frame further reduces the possibility of road shocks being transmitted to the interior of the new 220.

Photos: Jesse Alexander Julius Weitmann



Above: Skull-like plastic ball is battered against dash board to test safety padding. Left: Helmeted test drivers try to break up the new car on one of the many torture stretches.



Above left: Test car with false grille is rolled from the deep freeze test chamber. Boots and helmets are no joke — the temperature in the test room can be taken down as low as minus four degrees. Mercedes-Benz top brass take a group of prototype cars on a Stuttgart-Naples-Stuttgart circuit just prior to series construction of the new model. This is one reason for the greatness inherent in all Mercedes-Benz automobiles — the men who build them like to drive. Above: A breakdown during the run has everybody out and under the disabled car hunting for the trouble.

ster's third rear coil spring, the so-called "transverse compensating spring". With this device, a given spring rate (alias "riding comfort") can be achieved with a much reduced roll stiffness (to eliminate "oversteer"). Thoughts turned at this time to the actual assembly line problems with the new car and a special model of fiberglass panels is constructed in one-fifth scale. Individual pressings are painted different colors and it is all studied by time and motion experts.

Very soon the actual prototype is under construction at Sindelfingen. The chassis *cum* body is given structural tests. As cars become available, Uhlenhaut goes to work on the Mercedes test track, seeking out the weak spots. Then, disguised prototypes are dispatched on increasingly longer trips away from the factory, and as the deadline approaches, the engineers' overtime skyrockets; more and more cigarettes are smoked and the black German coffee gets blacker.

Noise tests are made. A car is put into the deep freeze room. Final suspension modifications are made as a result of the preliminary road tests. Already, rumors are flying around Stuttgart, for it's not easy to keep a secret. Even a photo or two appears in the press as prototypes are occasionally discovered parked in remote areas. They are painted an olive drab and have fake emblems on their noses, but the eager press is not easily led astray.

Early in 1959, the final road test is made. A group of four prototypes, accompanied by a squad from Uhlenhaut's department, are dispatched from Stuttgart. Aim: reach Naples and return as quickly as possible. Driving are Uhlenhaut, Mueller, Wilfert, and even Professor Nallinger. The route includes part of the Mille Miglia course and Uhlenhaut leads the charging group flat out across the rough, twisty Futa and Raticosa passes.

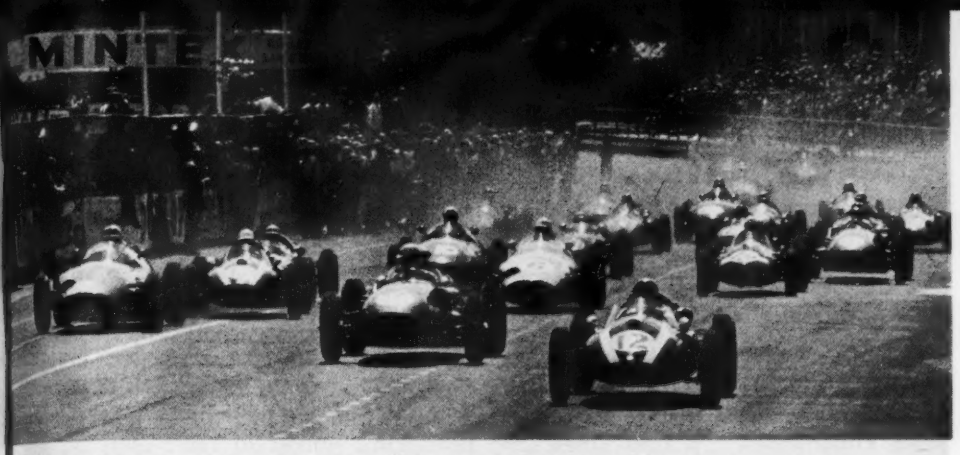
This is the last chance for weak points to show themselves for the preliminary two-a-day production will shortly begin. These guinea pigs will not be sold; rather they will find their way into the factory motor pool—some going back to Uhlenhaut for even further thrashing. But finally, the cars actually get into production. Then it's time for the Press to be invited in.

We journeyed down to Besancon in the French Jura, as the guest of Artur Keser, Daimler-Benz press chief. Seven cars were at our disposal; the normal 220, the 220S and the fuel-injected 220SE, some with Hydrak automatic clutch, others without. One car, a black 220S, was fitted with the alternative hard springs, and it was our favorite for it could be driven hard and fast.

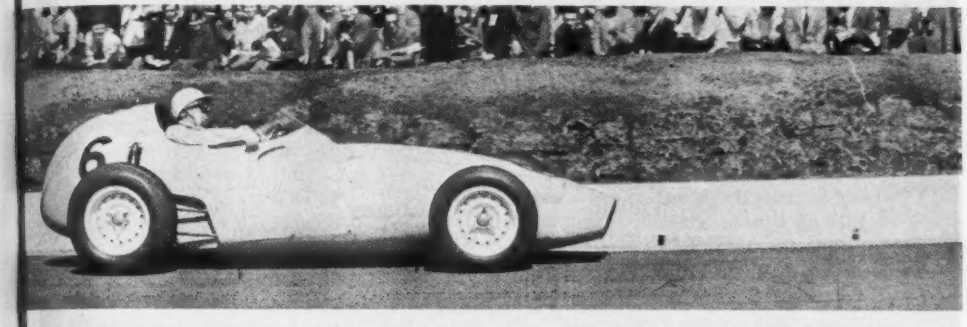
But we're jumping ahead—first a run down on the new car. The 220 is now what the 219 used to be and a very fine car it is. The 220S has slightly more steam while the luxurious 220SE really is a performer. Its fuel injection system has been reworked with straight ram pipes fitted on the intake manifold and the car has a degree of flexibility and performance coming from a 2.2 liter engine that is unbelievable. It is rated at 143 hp at 5000 rpm, and will rev willingly and without harm up to 6400 rpm.

Uhlenhaut was there and he told us, "You can drive this car faster in the corners than the 190SL." We didn't believe him but the proof was in the riding. We say right here and now that Mercedes have designed a four-door sedan that will corner faster and *safer* than most low-to medium-priced sports cars. Handling has been altered to suit the average driver, by eliminating all traces of final oversteer. The car is now as neutral as one could want and can be driven hard all day long with ease and in amazing comfort. The seating position is absolutely superb, at least for this reporter. The servo-assisted brakes on the S and the SE seem fully up to the job.

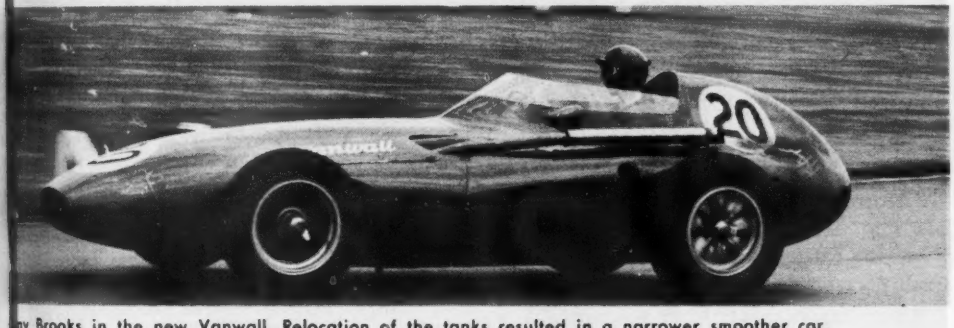
These are our initial driving impressions of the new 220. It is a car that sets an entirely new standard in passenger car design and most manufacturers will find themselves hard put to keep up, let alone exceed. SCI hopes to publish a full road test soon. Until then, take a long, hard look at this new car, for it is a masterpiece. *jla*



tart of the British Grand Prix. Brabham in #12 is already ahead of Salvadori's Aston on his ight. Harry Schell in the BRM is at extreme left of picture, a Cooper moving up on his left.



irling Moss drove the BRM entered by the British Racing Partnership (Alfred Moss-Ken Gregory).



y Brooks in the new Vanwall. Relocation of the tanks resulted in a narrower smoother car. ss repassed McLaren after second pit stop but couldn't shake him. Here they start their t lap in which both of them broke the now-pulverized lap record with a time of 1:57.01

Photos: Jesse Alexander

BRITISH GRAND PRIX

y *Jesse Alexander*

► The site of the British Grand Prix alternates annually between Silverstone to the South, and Aintree in the North of England near Liverpool. Aintree is best known of course for the famous "Grand National" steeplechase that is held there every year. Directly adjacent to the horse track is a 3-mile road-racing circuit, a typically English circuit in that it is flat, well-paved, uninteresting and unchallenging to the driver. Once every other year the B.A.R.C. (British Automobile Racing Club) gets the job of organizing the British GP at Aintree and it is undoubtedly the least inviting fixture on the calendar. Nevertheless, SCI decided to attend, for the first time.

This year's Grand Prix attracted the usual Formula I and Formula II lineup, with the outstanding exception of Fer-

rari, who were apparently in the throes of a labor dispute when it came time to prepare the cars for Aintree. (Ed. Note: Whether it was the metal-worker's strike, Mrs. Topham's tight purse strings or just Enzo's realization that, of all places he couldn't beat the Coopers, etc., Aintree was the worst.) As a result of the Ferrari no-show, Tony Brooks was released from his contract and allowed to drive a Vanwall at Aintree. This much rumored and discussed "new Vanwall" had been tested by Stirling Moss several months before and he had rejected it for a BRM which he drove at Reims and at Aintree. We were all eager to see the new car and it was surrounded by curious racing types when we arrived in the pits. Outwardly the car looks very much like last year's, but if one looks closely there are certain alterations to be discerned that have given the car a lower and longer line.

The side fuel tanks have been removed and put at the rear of the new Vanwall and the chassis has undergone a weight-paring session during the winter months. A siege of brake trouble throughout the entire meeting suggested further that they had been experimenting with new materials. Under the hood the car again looks very similar to last year's cars and the engine is reportedly putting out close to 275 horses. However, the car's performance was disappointing; Brooks was only able to cut a 2:04 practice lap, six seconds slower than the cars on the front row of the grid, and during the early part of the race Brooks was plagued with a recurring misfire which eventually caused his retirement. Even Bristow's 1.5 liter Cooper-Borgward was going faster in training than the Vanwall! It was obvious that the only reason the Vanwall came to Aintree was because Brooks happened to be out of work that particular weekend. We doubt very much if we will see the car again this year simply because there's no one readily available to drive it.

The Cooper-Climaxes seem to go faster with each race, and Jack Brabham is now well on the way to becoming 1959 World Champion. Stirling Moss has finally made up his mind and will only be seen in Coopers the rest of the season. With a new cylinder head that was fitted to Brabham's engine for the Aintree race, there has been a noticeable increase in performance. An honest 250 horses are now being realized from the twin-cam Climax engine. Bruce McLaren was the sensation of the Aintree meeting, however, as he tucked in behind Moss towards the end of the race, dogging him like a small, but determined puppy. At the finish line he was only 2 tenths of a second behind Stirling! On the final lap he managed to equal Moss's 1:57 lap record. But Brabham had the race in his pocket right from the very beginning, leading all the way, just as Tony Brooks had led the parade at Reims two weeks before.

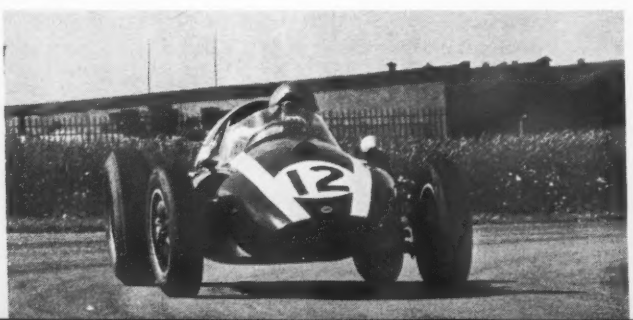
Harry Schell's 1:59 practice lap, which put him in the front row of the grid, was most amazing for old Harry and he sort of put Jo Bonnier to shame following the latter's Zandvoort win. Moss was again in the BRP BRM, painted a light green, and he did his utmost to carve away at Brabham's lead in the early laps and managed to get the gap down to slightly more than 8 seconds when he called at the pits for a tire change at 50 laps. Then 16 laps later he was again in the pits for more fuel, both these moves costing him the possibility of winning the race for he had

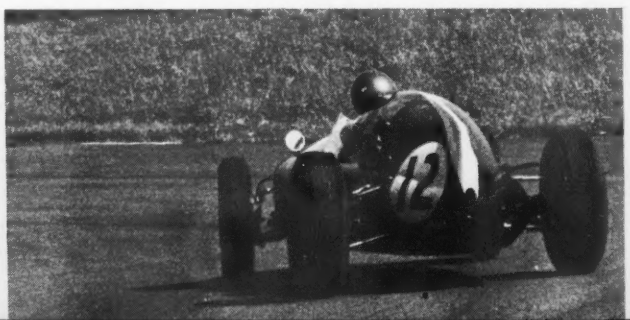
(Continued on page 86)

STARTING GRID POSITIONS

12 (1m. 58.0s.) J. Brabham (Cooper Climax)	2 (1m. 58.0s.) R. Salvadori (Aston Martin)	8 (1m. 59.2s.) H. Schell (B. R. M.)
18 (1m. 59.2s.) M. Trintignant (Cooper Climax)	14 (1m. 59.4s.) M. Gregory (Cooper Climax)	
4 (1m. 59.6s.) C. Shelby (Aston Martin)	6 (1m. 59.6.) S. Moss (B. R. M.)	16 (1m. 59.6s.) B. McLaren (Cooper Climax)
28 (2m. 00.0s.) G. Hill (Lotus Climax)	10 (2m. 00.0s.) J. Bonnier (B. R. M.)	
42 (2m. 00.2s.) R. Flockhart (B. R. M.)	30 (2m. 02.8s.) I. Ireland (Lotus Climax)	22 (2m. 03.0s.) I. Burgess (Cooper Maserati)
36 (2m. 03.0s.) B. Naylor (J.B.W. Maserati)	38 (m. 04.2s.) J.E.G. Fairman (Cooper Climax)	
48 (2m. 04.4s.) C. Bristow (Cooper Borgward)	20 (2m. 04.6s.) C.A.S. Brooks (Vanwall)	46 (2m. 04.8s.) I. Bueb (Cooper Borgward)
54 (2n. 05.6s.) H. Hermann (Cooper Maserati)	40 (2m. 05.6s.) F. d'Orey (Maserati)	
58 (2m. 05.6s.) H. C. Taylor (Cooper Climax)	64 (2m. 06.0s.) D. R. Piper (Lotus Climax)	52 (2m. 06.2s.) P. Ashdown (Cooper Climax)
50 (2m. 07.0s.) M.J.C. Taylor (Cooper Climax)		

Brabham's technique on tight turns with his nimble Cooper amazes and delights Europeans. Stemming from his dirt track experience "down under," it involves "tossing" the basically understeering Cooper (left) into what happens to be a very stable, controllable oversteer posture (right). This involves steering into turn abruptly, then paying off rapidly as the tail comes out, so much so that he's finally steering well out of the turn.





GERMAN GRAND PRIX

by Jesse Alexander

▶ Annually the AVD (Automobile Club von Deutschland) have the task of putting on the German Grand Prix, usually held on the Nürburgring, but since the club had a poor gate last year they began to look about for an alternative location in 1959. Their choice fell on the 5-mile Berlin-Avus circuit, mostly due to the superior financial guarantees from the Berlin City Council, higher than could have ever been extracted from the Rheinland-Pfalz state government where the Nürburgring is located. As soon as the AVD's decision was made public, protests from every one connected with the sport came thick and fast.

"The Avus is a stupid circuit."

"It should have no bearing on the Formula-1 Driver's Championship."

"Who wants to go to Berlin anyway?"

"Avus is Germany's worst race course."

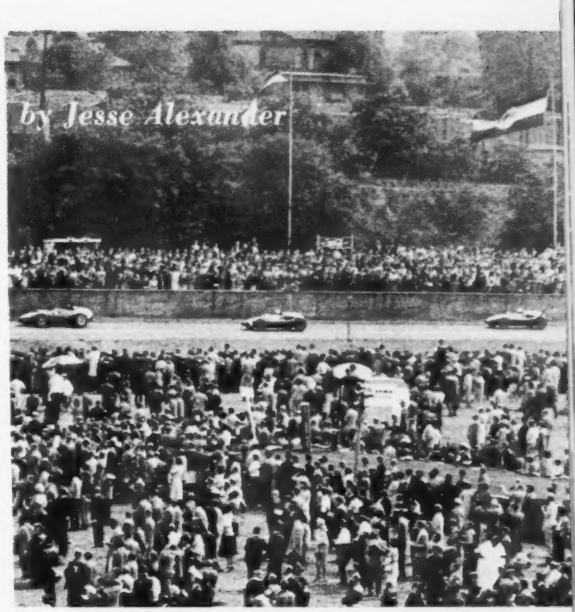
These were some of the comments heard months before it came time to think about travelling to Berlin, and all the talk in the world couldn't dissuade the AVD from revoking their decision. But considering the above statements, we had personally been looking for an excuse to visit Berlin for some time and so were actually pleased at the prospect of being able to see the former German capitol, a city we had been reading about constantly lately. Pan American flies 54 daily flights in and out of Berlin to various cities of Western Germany and from Stuttgart the trip takes just 2 hours. Suddenly your plane seems to land deep in the city for Templehof airfield is undoubtedly unique in the world, being built extremely close to the center of the city. Berlin itself, that is, West Berlin, is a throbbing, exciting international city of light and sound, a pinpoint of capitalistic light in Russian-dominated East Germany. It is obvious, once one has been there, that the city will continue to be an international bone of contention for some time.

Avus is not a "stupid" circuit. It is, on the contrary, a unique high-speed track belonging in the same category as Indianapolis or Monza, though it is inferior to both. To our way of thinking, it is a mistake to include such high-speed tracks on the Formula-1 calendar. If it were to be used once a year or every other year as an orgy of sheer speed for Indy-type cars, this could become a significant event. Providing, however, that the owners of the track were willing to sink more money into it to make it smoother and safer. The layout consists of four miles of German Autobahn, joined at both ends by corners, the north curve being a very impressive brick-paved banking, a changing radius, the lip of which is near-vertical and lacking any kind of barrier at the top. The banking cannot be taken flat out, even when dry, and when wet the brick surface has about as much grip as the bathroom floor on Saturday night. The spectacle of cars sailing around at 126 mph flat against the wall is a thrilling one for the spectators but not a comfortable one for the drivers, due to the "G" forces encountered and the bumpy surface. Entering the banking at about 125 mph, the Formula 1 cars came off at about 135; they then shoot across the center of the Autobahn and down the right-hand side flat out for 4 miles to the other end where a "slow" 50 mile an hour "hairpin" is situated. They then charge off in the opposite direction flat-out 'till the final approach to the banking. The autobahn is not dead straight as most people suppose, for on the contrary, about 500 meters from the "hairpin" a definite kink presents itself demanding that the cars be positioned properly in their approach. Likewise, on the return straight, before one arrives at the banking, the road turns right in a flat-out bend while at the same time the road surface changes to the brick construction of the banking.

Except for a few people who attempted to enter on the wrong road or who didn't have enough room in their passports for the East German transit visa, there were no border incidents or hold-ups. Ferrari and Coopers brought their cars in by road while BRM chartered a DC-6. With the foregoing comments we hope to have put the Avus race in a more objective light as the race itself was far from dull, providing quite a spectacle for the 100,000 Berliners from both East and West who had come to see the races.

Right from the first practice session, it was obvious that if their engines held together, the Ferraris would emerge as winners; for to stay with the Italian cars, the

(Continued on page 95)



A view across the infield to the approach to the banking in the early laps of the first heat. Ferrari, three Coppers.

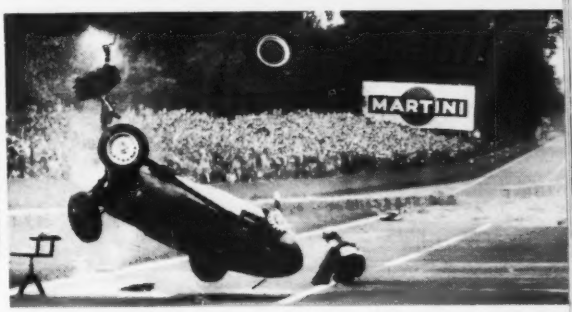
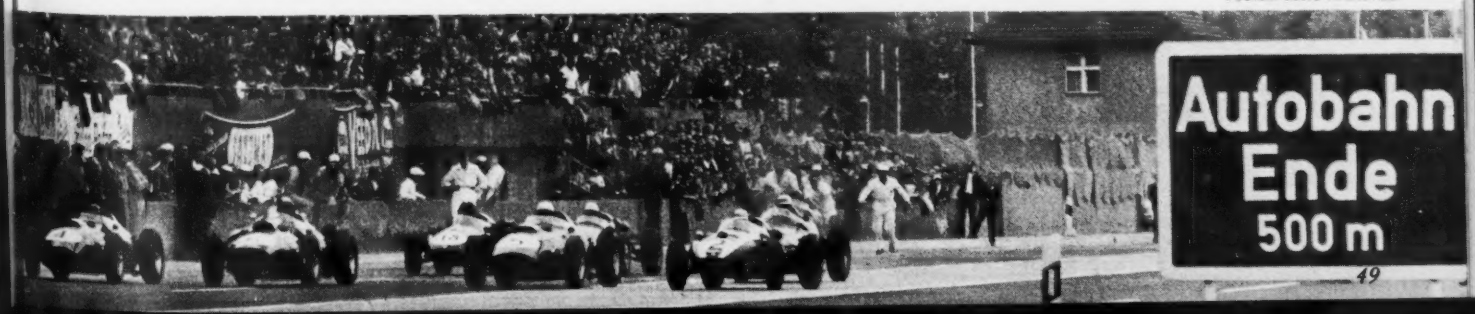


Photo: Julius Weitmann

Hans Hermann comes out of his BRM all right, an argument against seat belts, perhaps.

Above: Dan Gurney at the approach to the south hairpin. Below: Start of the second heat; only a few cars left. The three Ferraris in the front row, McLaren #2 on right.

Photos: Jesse Alexander



First heat saw furious 130 mph battle for the lead as Brooks (Ferrari), Gurney (Ferrari) and Gregory (Cooper) each took turns in leading the field along North Curve's brick banking.

GEARS CAN MAKE YOU GO

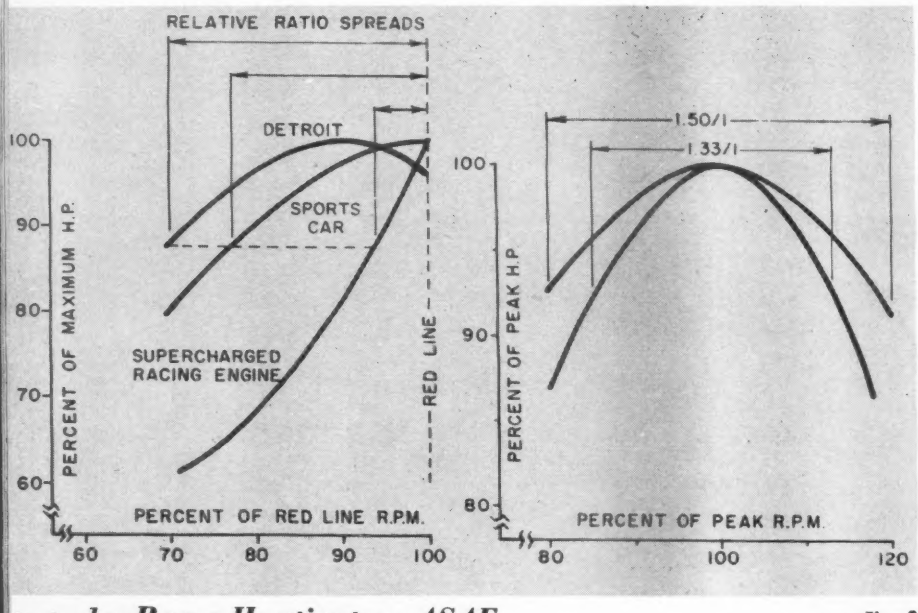


Fig. 1

Fig. 2

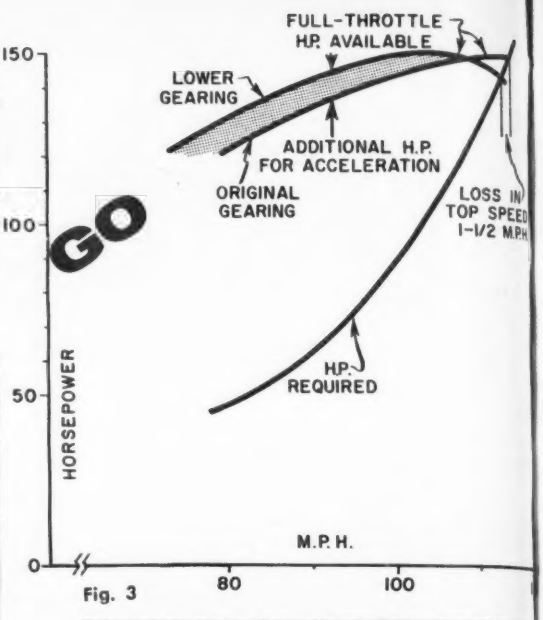


Fig. 3

Figures 1 and 2 show how highly tuned sports and racing engines require closer ratio gearboxes than touring engines from Detroit. The sharper the power peak, the closer must be the ratios. Figure 3 indicates how small increase in final drive ratio gives only slightly lower top speed (hence term "lower gear") but sharply improved acceleration.

by Roger Huntington, ASAE

► The cheapest, simplest and safest way to hop up a production car is to get the right *gear ratios* in it. When a car comes from the factory its gear ratios are a compromise for maximum overall performance and convenience under normal driving conditions. By juggling those compromises — taking a little here and giving a little there — you can definitely improve its acceleration from a standing start, its top speed, or, and this is the clincher, its average speed around any given road racing circuit. If you're lucky, you may get a combination of these, or even all three. The right gear ratio combination, properly used, is worth a 20% horsepower boost on any car. Why spend money for hot cams and big carburetors until you give your engine a little elbow room with gears??

Here are some ideas . . .

FIRST THINGS FIRST

The basic purpose of gears in a car is to put the engine horsepower curve in some pre-determined position relative to road speed — in other words, get maximum HP at some desired road speed. If your engine peaks at, say, 5500 rpm, by proper selection of gear ratio and tire size you can bring in that maximum punch at a road speed of 100 mph, or 50 mph, or 150 mph, or any other speeds . . . anywhere you want it (including, oddly enough, speeds which the car cannot attain). Here's a simple formula for determining the needed gear ratio:

$$G = \frac{RPM \times R}{168 \times MPH}$$

where G is the gear ratio and R is the rear tire's rolling radius in inches. For example, if we want 5500 rpm at a road speed of 85 mph, and the tie's radius is 13¼ inches, the needed gear ratio is; (5500 x 13¼) ÷ (168 x 85) = 5.10. Nothing to it.

Rolling radius can be reasonably approximated for these purposes by merely measuring from the center of the wheel to the ground while the car is at rest. (Not good enough, though, for rallying precision.)

If you should be so fortunate as to have factory data, you may find the rolling radius expressed in terms of wheel revs per mile. In this case the formula becomes:

$$G = \frac{(60 \times RPM)}{(MPH \times Revs/mile)}$$

In the same example as before, the 6.70 x 15 racing tire (Firestone SS-170) has a revs/mile figure of 759, so (60 x 5500) ÷ (85 x 759) still equals 5.10.

Remember that G, the gear ratio is actually the product of the rear axle ratio (sometimes called the final drive ratio, especially on front-wheel-drive cars) and the particular transmission ratio being used. The latter is usually 1.0 for top gear, but not always. In SCI road tests, G is listed under the heading of overall ratio.

DON'T TALK TORQUE, TALK POWER

When studying gear ratio problems, forget about torque. Sure, the gears multiply torque, but if you work and think in terms of horsepower, you'll be better off. Look at it this way. Horsepower is indeed proportional to Torque times RPM, but it is also proportional to Speed times Force. In our case, the force is tire Thrust for horsepower available, and Drag for HP required. Torque is a force acting at a distance, in other words, the twisting force on the crankshaft. An engine develops its maximum torque at some medium RPM where breathing is good and friction losses low. On the other hand, horsepower means the ability to perform a certain number of foot-pounds of work in a unit of time (1 hp equals 550 ft-lbs of work per second, i.e., lifting 550 lbs one foot every second. This is what it takes to get a car down the road in a hurry, or up a hill in a hurry, or from zero to 100 mph in a hurry — or around Elkhart Lake in less than three minutes. You want to do maximum work in minimum time.

Get this: On *different* engines, there is no inherent relationship between HP and torque. A small-inch engine running at 6000 rpm might put out as much horsepower as a big mill at 4000. The big-inch job would be kicking out a lot more torque, but as long as both engines are kept winding up around the peak of the power curve, the car performance will be the same (assuming equal power to weight ratios for both cars). Torque is for guys who don't like to shift gears. We don't need to worry about it here.

There is a popular misconception that the ideal set of gear ratios in a gearbox is such that you should shift from peak power in the lower gear to peak torque in the next and that this is the proper way to make your shifts. This isn't so. Even in very highly tuned racing engines, following this line of thought would cause you to shift consistently too early. In tour-

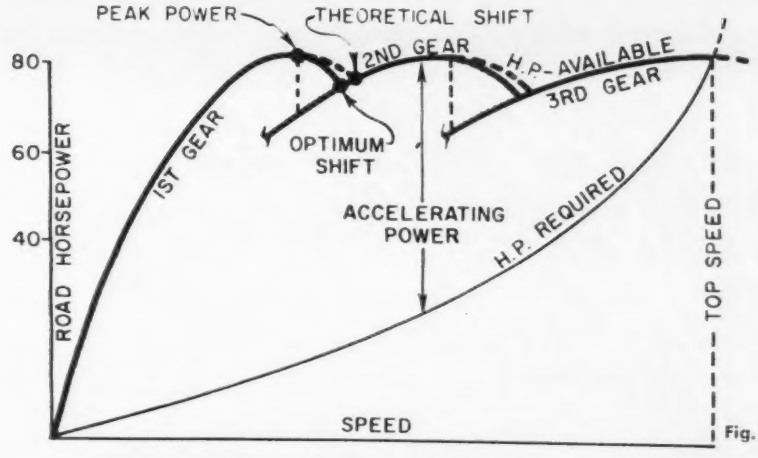


Fig. 4

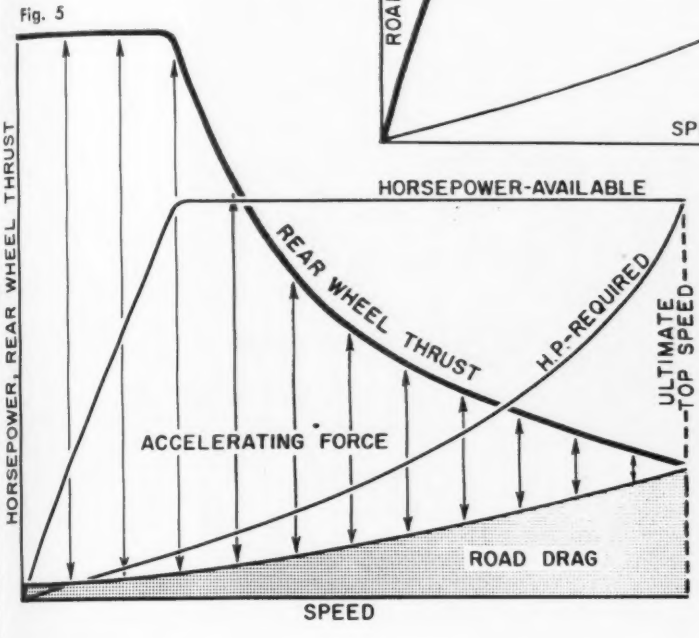


Fig. 5

Figure 4 shows how winding beyond the speed of peak power will improve acceleration despite drop-off in power. It's less than the drop when you shift to the next higher gear. Flywheel inertia puts optimum shift point below theoretical one. Red-line limits are not shown here, but should never be exceeded. Figure 5 indicates performance obtainable with "ideal", infinite ratio transmission. Shown too is relation of thrust to HP.

ing engines, it's even more misguided. Forget about torque as such and think only in terms of the HP curve.

WHY TO OVER-REV

Let's look at it this way. A normal engine's power curve has quite a smooth, rounded peak; it's not usually a sharp peak — and the drop-off in HP on both sides of the peak point is quite gradual. For instance, if an engine peaked, say, 150 hp at 5500 rpm, the output at 5000 would be about 146 hp — and at 6000, about 144. In other words, on most engines the power output doesn't drop 5% when running 500-600 rpm above or below the peak. This gives you a broad effective rev range to play with. It means you can wind well *beyond* the peak of the power curve to get a wider rev range in any one gear. We'll see how we can use this principle later.

If you're gearing your car primarily for performance (as opposed to gearing for fuel economy or smooth cruising), the axle gear ratio will be selected on a basis of "terminal" speed — that is, the highest road speed reached under the performance conditions you're gearing for. If you're gearing for a slow road course, where car speed never gets above 80 mph, select an axle ratio that will bring you peak horsepower at 80 mph in top gear. If gearing for top speed on a long straightaway, use a ratio that will match HP-available with HP-required.

On the other hand, a ratio for quarter-mile dragging should let the engine peak noticeably before the finish line. Here we come to this business of winding beyond the peak of the power curve. Take that engine we mentioned earlier that develops a peak of 150 hp at 5500 rpm. Let's say the curve of required HP to drive this particular car reaches 150 hp at 115 mph. We would get ultimate top speed with a gear that would let the engine wind 5500 rpm at a road speed of just 115 mph. But let's select a little lower gear (numerically higher) that will let us wind around 6000 in this range. Now we have only 144 hp available. But the Power-required curve is rising very rapidly here — and the 144 hp is sufficient to drive the car at 113½ mph. In return for this loss of 1½ mph in top speed we get much improved acceleration at speeds below the peak. The HP available for acceleration actually *increases* as speed falls back. With the low gearing we get 150 hp at 105 mph and 146 hp at 96 mph. With "optimum" top speed gearing the power has dropped back to 146 at 105 mph — and keeps on dropping from there. With the low gearing the car can get up to top speed a lot quicker, can hold that speed against headwinds, gusts, small grades in the course, all this for a sacrifice of only 1½ mph in top speed.

Overall performance in almost all kinds of competition is improved if we gear to wind roughly 10% beyond the peak of the power curve at the terminal speed. With our peak at 5500 rpm we'd want to hit 5800-6000 at terminal speed. If that speed is only 70 or 80 mph on a very slow road circuit, this means either a very low axle ratio or using next-to-top gear in the transmission for terminal speed — and sacrificing one gear. For ultimate top speed on a straightaway let the engine wind a little over the peak and see how much better results you get.

For quarter-mile dragging, estimate your speed at the end of the course from performance of similar cars, and then gear to hit 5 or 10% beyond the peak at this speed. (Don't be too pessimistic here or you'll overwind; better to test your car with conventional gearing first, and then assume it will go 2 or 3 mph faster with optimum gearing.) Overwinding is especially beneficial with big Detroit engines, where inferior breathing generally puts the power peak below 5000 rpm. Running up to 5500 or so — or up to the valve float to tappet pump-up point — will make a new car out of these babies. Keep it in mind.

BEWARE THE RED LINE!

All the above is aimed at the understressed American-style engine. Highly tuned engines, no matter where they are made, breathe well enough so they can be revved up to self-destructive speeds. To prevent this sort of expensive disaster, tachometers carry a red-line, an indication of how far you can go and get away with it. Often the limit is so close to the peaking speed that you can't run even 5% over without exceeding it.

Balancing the innards as described in SCI's Preparation for Competition articles (*not* the surface-type balance job which makes up on the water pump pulley and flywheel for the mismatching of pistons or con rods for external smoothness—and internal confusion) will enable you to use higher revs than the factory would dare think of in a run-of-production engine.

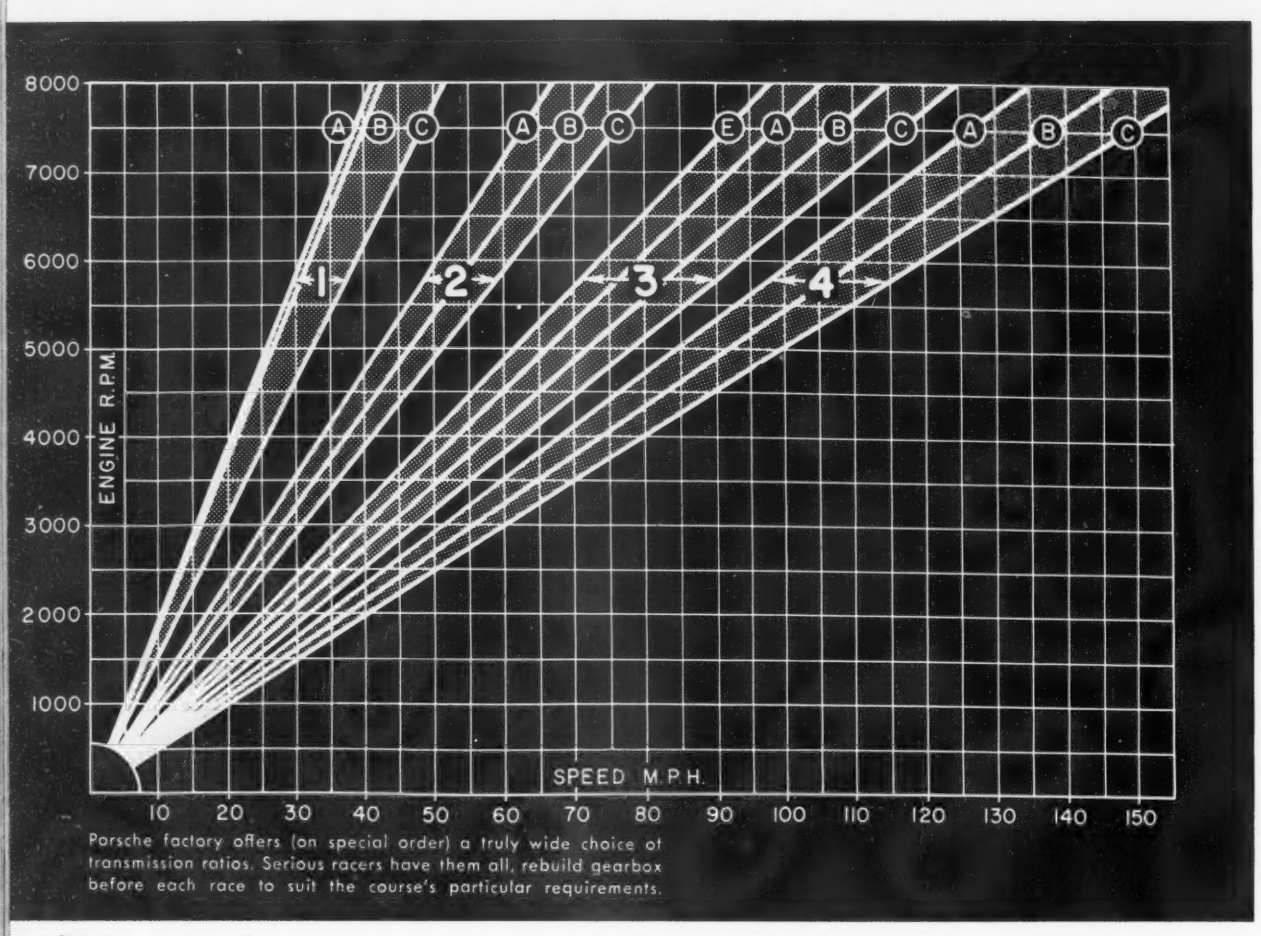


Fig. 6

Different factories have different ideas about how conservative they should be on this score; the best thing to do is talk to other competitors who drive your brand of car and find out what they've been getting away with.

But if your engine has never been torn down for a precision balance job, you ignore that red-line at your own risk!

TRANSMISSION RATIOS

The ideal racing transmission would have an infinite number of speed ratios, automatically controlled to hold the engine RPM right at the peak of the power curve over a road speed range from perhaps 25 mph (or tire spin point with full HP) up to the top speed of the car—and with a mechanical efficiency of 95% or more on all ratios. No such transmission has ever been built (this statement will surely bring a flood of letters from inventors!) — nor is it likely that anything approching this ideal performance will be available in the next decade. So we must compromise. We settle for several fixed speed ratios in a compact gearbox in the drive line, with gears shifted by hand at the discretion of the driver.

The next question is: How many fixed gear ratios should we have, and what should be the spread between them? This is a complex question, and there's no hard and fast answer in any case. Every gearing problem is a compromise — and, like axle gearing, transmission ratios selected for competition are entirely different from those for road use. For the racing man the choice of number of gears and ratio spreads should depend primarily on three basic factors: (1) Time lost in shifting; (2) the shape of the power curve in its usable range around the peak; and (3) the speed range of the race course we're gearing for.

The reasons behind these factors are simple. Obviously if very much time is spent shifting gears, you will lose all the time gained by keeping the engine closer to the power peak. Most racing drivers like to be able to do most of their driving in *two* gears — to prevent excessive time loss in shifting, to control fatigue on long races, to let them concentrate more on steering and throttle control, and to give just that much less chance of missing a hard shift and maybe wrecking a gearbox. To the racing driver, the fewer gears he can get along with the better. As one old-timer put it, "You don't win races shifting gears."

The general shape of the engine power curve in its usable range is a vital factor in ratio selection. First, consider the case where you can wind well above the power curve peak with safety (as on most American engines): Here you can use relatively wide ratio spreads, especially if the power curve has a big, broad peak. On some big-inch engines the HP output around the peak doesn't vary more than 2% over a range of 1000 rpm; these engines can profitably use ratio spreads of 1.6/1 or more. Sharper peaks — characteristic of small, high-speed engines (especially those with "tuned" intake and exhaust) — call for closer ratios. In cases where the engine is red-lined at the peak (or even below on some ultra-high-speed racing engines) ratio spreads have got to be even closer — because HP output is dropping sharply with RPM. Some of these cars will feel sluggish with gear ratio spreads wider than about 1.2/1. Probably the most notable example of this was the centrifugally-supercharged B.R.M. Grand Prix car, which had a power curve still rising steeply at 12,000 rpm! You had to shift gears continually with it, and still couldn't do anything.

Then there's the factor of car speed range and its effect on gear selection. This is mostly a problem with all-out racing cars (both sports and G.P.) on very fast courses like Le Mans, where you can get up to 180 mph on the straights and have to pull out of some slow corners at 35 or so. Here you can use five, or even six, speeds to adequately cover the 145-mph speed range in between. In most amateur U.S. road racing with production and semi-production sports cars the speed range would more likely vary from 30 mph or so up to maybe a top of 120. In this case a four-speed box with average ratio spreads around 1.35:1 is fine.

Fortunately this gear pattern is also pretty good for the road. Road gearing is a little different problem than race gearing. A road car has got to have enough ratio in first to give good dig off the line and to give super traction for emergencies. In racing the start is of great importance, so much so that occasionally a special "starting" gear is provided on racing cars. Small-inch European engines generally require a 1st gear box ratio above 3.0/1 to accelerate briskly from a standing start — and, of course, this means that

(Continued on page 76)

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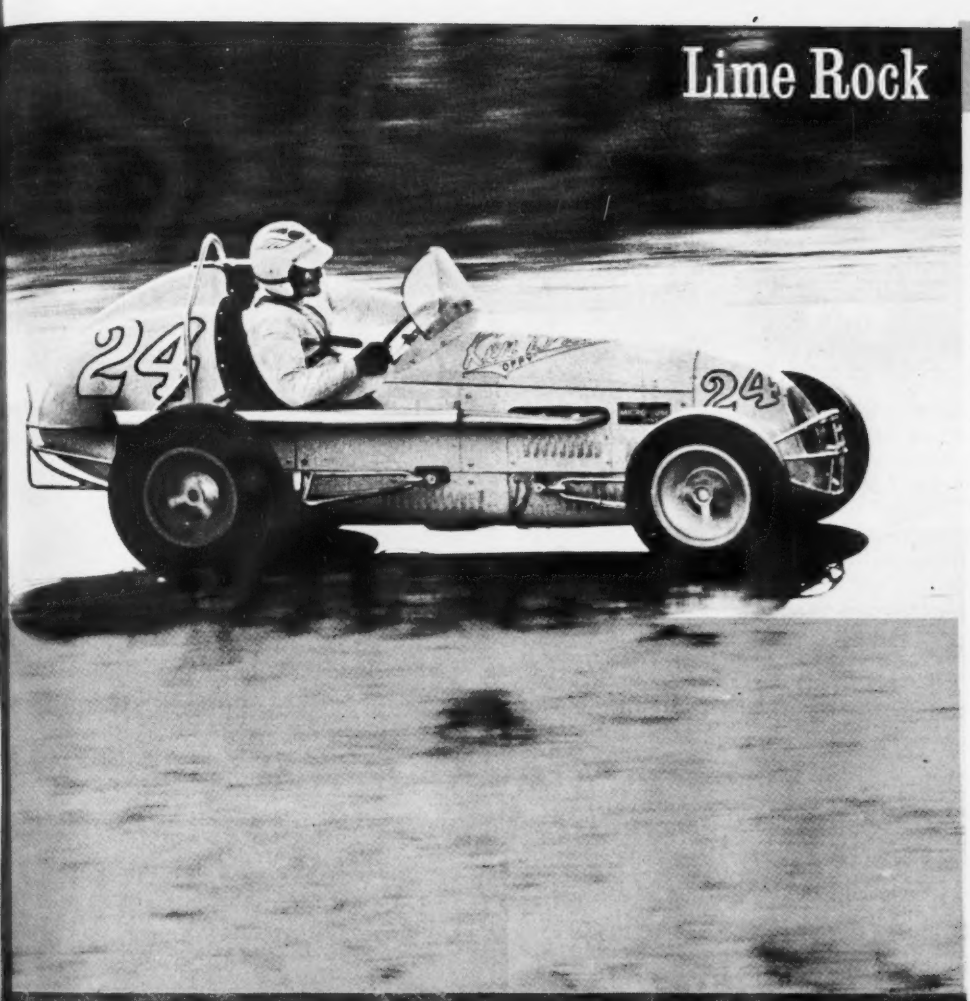
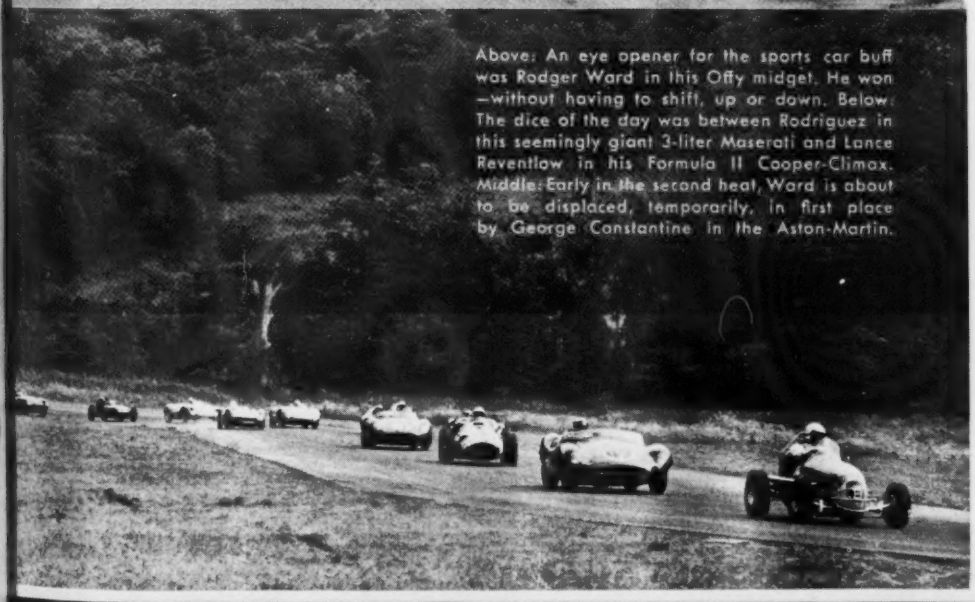
PEUGEOT

PRONOUNCED "POOJ-OH"

Lime Rock FORMULA LIBRE





Above: An eye opener for the sports car buff was Rodger Ward in this Offy midget. He won—without having to shift, up or down. Below: The dice of the day was between Rodriguez in this seemingly giant 3-liter Maserati and Lance Reventlow in his Formula II Cooper-Climax. Middle: Early in the second heat, Ward is about to be displaced, temporarily, in first place by George Constantine in the Aston-Martin.

Story and Photos by Irv Dolin

The USAC Formula Libre race at Lime Rock July 25th was unique in several respects. Depending on one's sentiments about motor racing, it might also be described, among other things, as inconclusive, tragic, encouraging, unsettling, prophetic or stimulating. That's a long list of adjectives but they all fit. One thing is certain—it was one of the most exciting contests, before one of the largest crowds, ever to be run at the Connecticut circuit.

Some of the above terms need explaining. The race was sponsored and extensively publicized in advance by the New York Mirror, one of the country's largest-selling tabloid newspapers. (Unique in the East.) The Mirror's previous concern with any form of auto racing had usually been confined to printing pictures of accidents of the more lurid variety, but largely through the efforts of John R. Hearst, Jr., an enthusiast and active driver in eastern SCCA events, the interest and support of the paper was secured.

The appearance of four track midgets, a Formula I car and two Formula II cars in addition to a good sports car turnout put real meaning into the term "Formula Libre." Such names as Lance Reventlow, Chuck Daigh, Pedro Rodriguez, Rodger Ward, Duane Carter and Tony Bettenhausen on the drivers list indicated that this form of racing is attracting more and more of the top drivers and cars from different sections of the sport. (Encouraging, stimulating.)

Most significant of all, the race was won by Rodger Ward driving a car theoretically unsuited for the course—or any road coarse for that matter—a 1.7 liter Offy-midget, 11 years old; with almost 1000 races behind it—using slick tires and a one-speed "gearbox." Almost incidentally he set a new lap record during his qualifying period before the race, clipping 4/10th of a second off the time recorded by George Constantine in the Aston Martin DBR-2 in a race earlier in the season. (Tragic—for the True Believers. Unsettling. Unique. Exciting.)

The race proved—what? That Ward is a versatile and polished driver? Certainly. That midgets can win road races? Yes and no. On a circuit like Lime Rock, yes. On circuits like Riverside, Bridgehampton or Watkins Glen with their long straights and tight turns, probably not. Other observers noted: What if the race

had gone 100 uninterrupted laps (150 miles) instead of being divided into three heats of 20, 20 and 60? Suppose Ward had had time enough to install the four-speed gearbox he'd planned on? What if Constantine hadn't been forced out in the last heat? (Inconclusive.) The spectators, largely untroubled by such questions, had themselves a ball and USAC would be wise to organize more meetings of this kind. (Prophetic.) Of course, the assistance of a large newspaper helps.

Notes And Comments

All the midgets were basically the same —Offenhauser engines, slick tires and yes-no gearboxes. Ward's car used 16" wheels and after losing the first heat to Constantine he had the rear axle ratio raised to give him better performance on the straight—the inside front wheel had been lifting when he accelerated out of corners. Naturally, the suspensions on the midgets had been adjusted so that the cars would handle on the right turns as well as the left. People used to seeing midgets performing on oval tracks sort of expected that a good deal of broadsliding would go on in the corners but this was not the case. In many instances they were smoother than the sports cars.

There are so many Corvette-engined Ferraris, Maseratis, D Jaguars, etc. racing now that it was amusing to hear Loyal Katskee's car referred to as a Ferrari-Ferrari.

Bob Said, often a victim of fate, was left with his helmet in his hand—again. One ride-to-be blew up; the other was a no-show.

Following open-wheeled cars has its hazards, Denise McCluggage discovered. Tailing Chuck Daigh in the long downhill turn into the straight, she was smacked in the goggles by a stone thrown up by one of those fat Maserati rear wheels. Fortunately, the right lens, although badly cracked, didn't shatter and she was able to press on to the finish with somewhat reduced depth perception.

The Bocar-X made a brief appearance in the first heat with Paul O'Shea driving. After some ragged laps it retired with rear end maladies.

The unofficial fashion award went to Reventlow and Daigh for their strikiing orange driving ensembles.

The white and blue Camoradi Maserati was using the new Goodyear "Grand Prix" tires, which are distinguished by a narrow blue "sidewall." Evaluating the tires' performance was difficult because of Daigh's unfamiliarity with the handling characteristics of the very touchy grand prix car . . . he hadn't even practiced in it. Although Chuck had things under control after a while, even taking the lead in the third heat, examination of the car after the race showed red paint under the white where the front wheels had rubbed during full-lock corrections.

The USAC method of scoring left everyone more or less confused and it was felt that the introduction of a simpler, and in the opinion of some, fairer scoring system would help attract more non-professional drivers to pro-am racing. USAC has been criticized in the past for the generally poor quality of cars in its sports car and free formula races—the majority of entries being "war wearies" or grotesque specials—and with the increased number of Formula Junior and Formula II cars being imported here (or being domestically designed and built) USAC is in a position to organize what should potentially be this country's most exciting form of motoring competition next to grand prix racing itself. That record crowd at Lime Rock proves it. —*id*

SUMMARIES

First Heat

1. George Constantine, Southbridge, Mass. (4.2 Aston Martin) . 2. Rodger Ward, Indianapolis, Ind. (1.7 Offy) . 3. Chuck Daigh, Long Beach, Calif. (2.5 Maserati GP) . 4. John Fitch, Lime Rock, Conn. (2.0 Cooper Monaco) . 5. Pedro Rodriguez, Mexico City, Mex. (3.0 Maserati) . 6. Lance Reventlow, Beverly Hills, Calif. (Cooper F-2) . 7. Russ Klar, Lynbrook, N.Y. (1.7 Offy) . 8. Dick Thompson, Washington, D.C. (4.9 Sting Ray) . 9. Bob Colombosian, Andover, Mass. (2.0 Lister Bristol) . 10. Vic Meinhardt, Merrick, N.Y. (1.5 Porsche RS) . 11. Ray Saidel, Manchester, N.H. (Jomar F-2) . 12. Loyal Katskee, Omaha, Neb. (3.0 Ferrari Monza) . 13. Denise McCluggage, New York City, N.Y. (1.5 Porsche RS) . 14. Bert Brooks, New Britain, Conn. (1.7 Offy) . 15. Gordon MacKenzie, Millbrook, N.Y. (3.4 C-Jaguar) . 16. Jokko Maggiacomo, Poughkeepsie, N.Y. (4.9 Ferrari-Corvette) . 17. John Grimaldi, Glen Rock, N.J. (3.4 D-Jaguar) . 18. Paul O'Shea, Rye, N.Y. (4.6 Bocar-Corvette) . 19. Duane Carter, Indianapolis, Ind. (1.7 Offy) .

Second Heat

1. Ward, 2. Constantine, 3. Daigh, 4. Fitch, 5. Rodriguez, 6. Reventlow, 7. Tony Bettenhausen (in Klar's midget), 8. Colombosian, 9. Thompson, 10. Brooks, 11. McCluggage, 12. Saidel, 13. Maggiacomo, 14. Katskee, 15. D. Carter, 16, Grimaldi, 17. MacKenzie, 18. Meinhardt, 19. O'Shea.

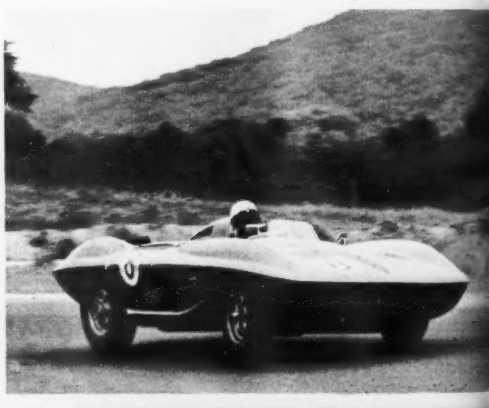
Third Heat

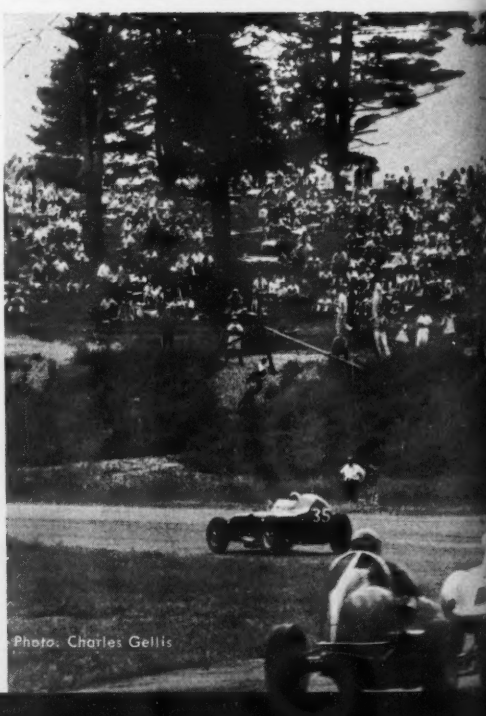
1. Ward, 2. Daigh, 3. Rodriguez, 4. Fitch. 5. Colombosian, 6. Brooks, 7. Thompson, 8. Reventlow, 9. Maggiacomo, 10. McCluggage, 11. Katskee, 12. Saidel, 13. D. Carter, 14. MacKenzie, 15. Boyle.

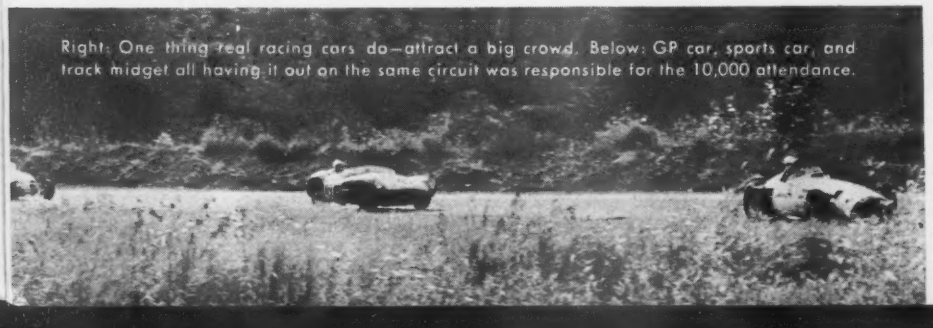
Final Standings

1. Ward, 2. Daigh, 3. Rodriguez, 4. Fitch, 5. Colombosian, 6. Constantine, 7. Reventlow, 8. Brooks, 9. Thompson, 10. Klar/Bettenhausen, 11. Maggiacomo, 12. McCluggage, 13. Saidel, 14. Katskee, 15. MacKenzie, 16. Grimaldi/Boyle, 17. D. Carter, 18. O'Shea, 19. Meinhardt.

Above: A plug change on Rodger Ward's winning car. Its immaculate finish is duplicated by any number of Offenhauser midgets running in the U.S. turn left circus. Below: Do Stingrays eat midgets? Duane Carter looks apprehensive as Dick Thompson comes charging up on him in the Chevrolet-powered 1990 Corvette.



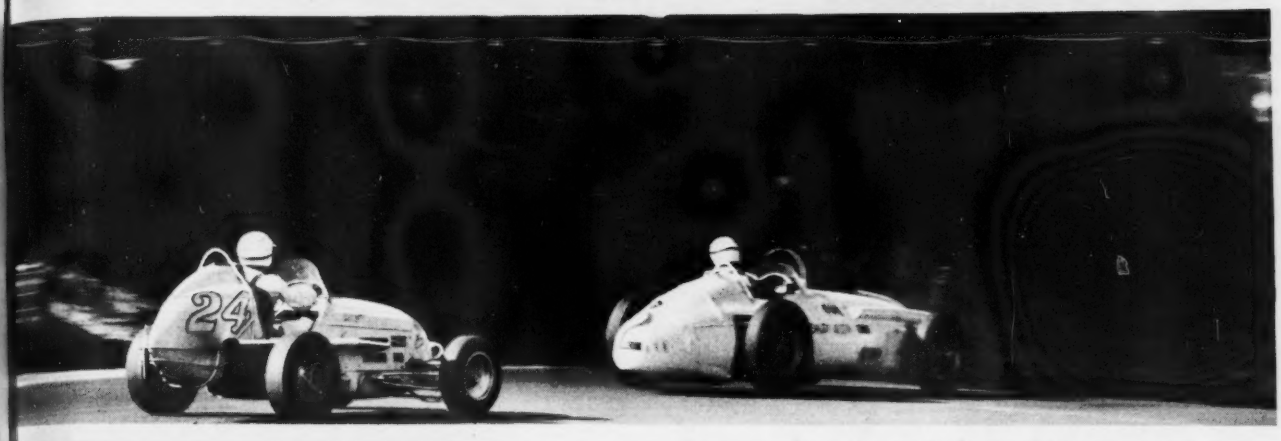




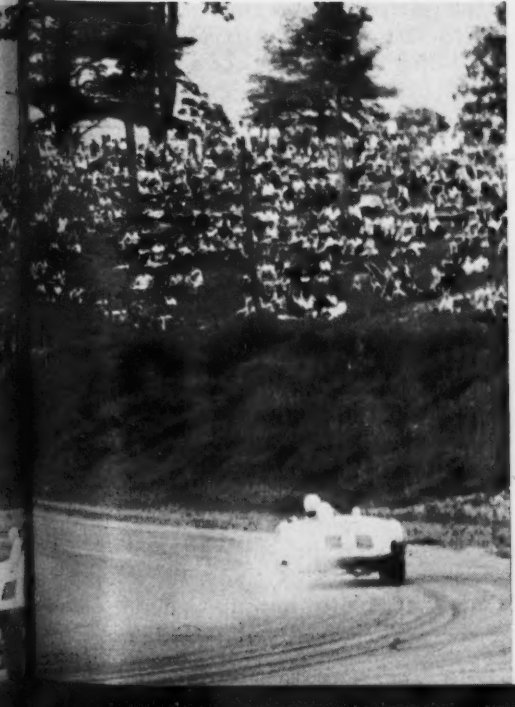
Right: One thing real racing cars do—attract a big crowd. Below: GP car, sports car, and track midget all having it out on the same circuit was responsible for the 10,000 attendance.

Photo: Charles Gellis

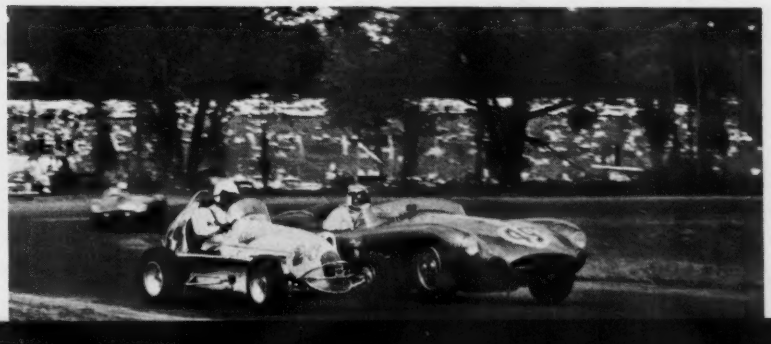
...et more gas per



Above: These were the cars! Rodger Ward in the midget chases Chuck Daigh in the honest to God Formula I 250 F Maserati. This car was reportedly an ex-works ex-Fangio machine. Below: Ray Saidel tries hard at the wheel of his Climax-powered Formula II Jomar. He had no trouble staying in front of bigger cars. Left: John Fitch had as his mount a quick, and brand new, 2-liter Cooper Monaco.



Above: . . . or when in doubt stand and shout. Below: The moment the True Believers dreaded—Ward passing Constantine for the first time. The midget's performance shook the assembled crowd. They forgot "A racing car is a racing car is a . . .



By Stephen F. Wilder

► Like its namesake, this is a special sort of race. Its third running this August saw its scope broadened to include Gran Turismos under both 1100 cc and $4500, while the old regulars were allowed to use racing tires and any factory-offered options.

Though this opened up the Volvo-Saab dominated prospects, no one thought the Swedish stranglehold would be loosened, much less broken. But the cool Scandinavians were in for a hot time, even though the race had been cut from ten to eight hours.

Providing a chance to run "full chat" for hours on end in unburstable machines, this race is immensely popular with road-racing drivers of the North-east. The way they finagle for a ride, one would think a Testa Rossa was up for grabs.

With entrants, it's a far different story. Few indeed are the private owners willing to foot the bill (mostly for tires, tires and more tires). This leaves it up to the distributor or importer who enters purely for the advertising profit.

Once burned is twice warned though, and rare is the also-ran who shows up again. No surprise, because a bad showing on the race course can easily hurt a fast-selling car. But to prove the reliability of a just-introduced model, why, it's ideal . . . if you can finish.

To aid and abet these promotionally minded efforts, there were seven classes besides Econo-Gran Touring. Maximum displacements were 2000, 1600, 1300, 1100, 900, 750, and 650 cubic centimeters.

Despite much pre-race confusion, at 10 A.M. Alec Ulmann dropped the flag. The drivers sprinted across in usual Le Mans fashion, but instead of acrobatics over the gunwhales, roaring engines and shrieking tires, the expectant crowd heard door slamming punctuated by the staccato bark of the Abarths and the limited screech of the big-inch Volvos.

As for the rest, it looked and sounded like 6:02 at Westport-Saugatuck stations in a bad dream. So did the crowding in the first turn which was again made especially sharp for this race. The next few laps saw a lot of sorting out and a little last minute seat-belt fastening.

The heat was on right from the start. It was 90° in the shade and class awards or no, Team Volvo didn't want to lose first overall to either the Abarth or Saab GTs. They breathed easier when Paul Richard's Abarth half-shaft let go after 22 laps in the lead.

"See," one of the Volvo team said, "they're only sprint cars, those Abarths. It's the tortoise and the hare story all over again." He was right, but he didn't know the half of it.

By noon the temperature was up to 100°. As if that wasn't enough, the Swedish entries ran with their heaters on to increase the amount of cooling water circulating. A Canadian Volvo driver keeled over in a dead faint at his noon pit stop, a bit demoralizing for his team-mates taking over.

Though they ran reliably and fast, the Saab GTs never materialized as the threat expected. Instead the overall battle was strictly between Abarths and Volvos, and grousers were heard wondering where you could get the push-rod Abarth with the twin-cam's lighter no-noggin-notch body at any price, much less for "under $4500."

For the lesser cars, it was full throttle all around the 1.5-mile course (braking only for the end of the straight), wondering how to squeeze out an extra mph—close the window, maybe?—and how fast the crew could change tires and refuel.

Except for laps 69 through 76, Volvos led, hour after hour. After six hot and hectic ones, it seemed Riley and Rutan had their third LLM win in their pockets with a faster than ever average. They had three laps over the nearest of two Abarths (Callahan-Penske). Behind, only a single Volvo was still in contention. Higher speeds and stiffer competition had taken their toll indeed, with three Volvos out and one way back.

But at 4:30, the leader pulled into the paddock through

(Continued on page 8

Photos: Patricia Caulfield

Pits: peopled with panic and picturesque pandemonium.

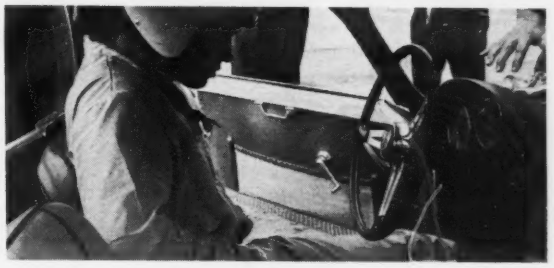
DAFs: demonstrably dependable.

Power for Prinz; 53 minutes, in and out.

"How else do I get him to pit?"

"Maybe if I close the windows I can out-pull him!"

Watching from the winner's welcome wagon.



Winner Penske fastens seat-belt before take-off.

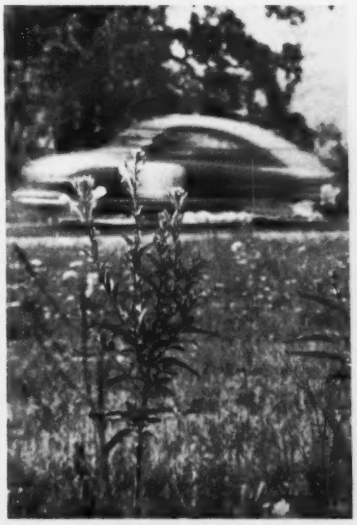
A diminutive fox gambols through the hen-house.

"Callahan, you're in the lead!"

Christy/Cronkhite: "I'll give you a scoop."

Lots of "I Spy" went on all day.

Little Le Boys?

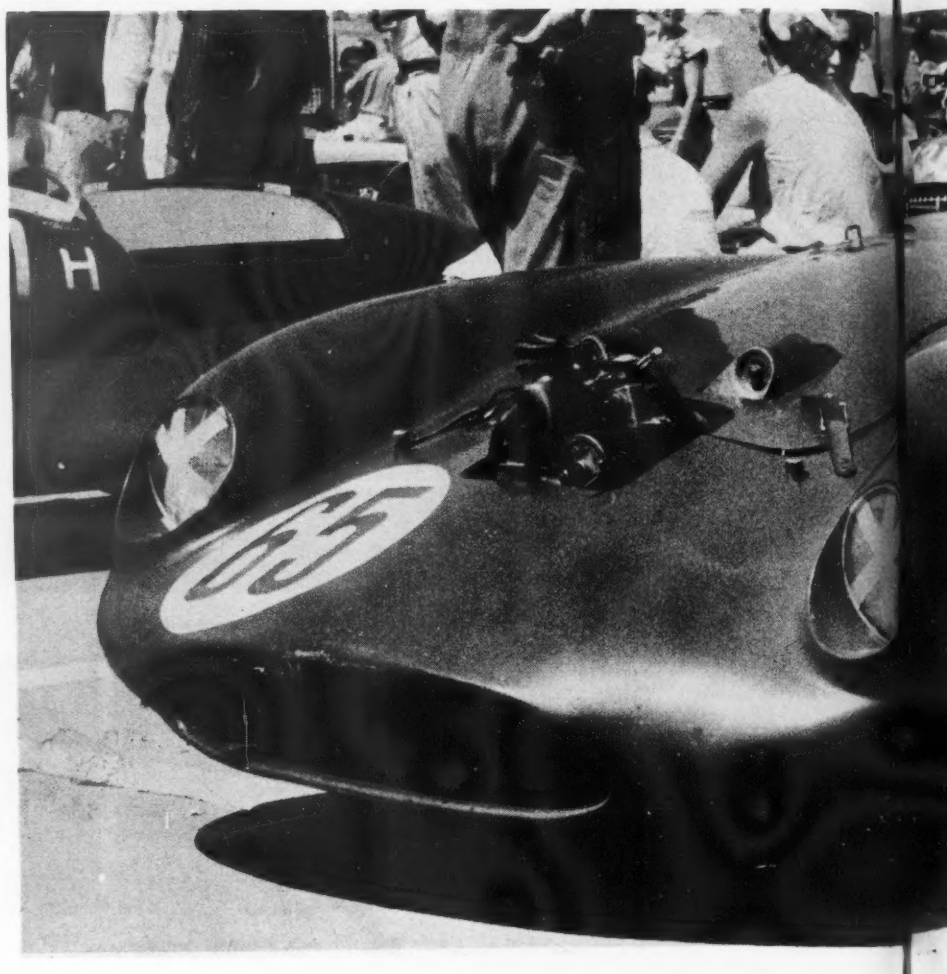


Saab GTs suffered, 93Bs swept.

Air-cooled Hearst was flip about Panhard.

THE SHORT, UNHAPPY LIFE OF THE MONZETTA

by Charles Beaumont



► In olden days when wars were fought by men selected for their prowess, would-be knights—too tall, too small, too awkward for their armor—stood upon the fringes of the battle grounds and watched and dreamed. On pirate vessels only half the crew donned handkerchiefs and swords and waded, slashing, into danger, while the other half looked on. A dozen lucky lions were picked by Nero, starved and set upon the Christians—yet consider all the other lions, mayhem running in their blood, who had to stay at home. It's true, it always has been true: a few are chosen. And throughout the corridors of Time, the cry echoes, "If they'd only let me out there, then I'd show the bastards!" It is a terrible sound.

We—knights, pirates, lions—were sitting over quarts of beer one evening, ruminating these and other thoughts. It may be that ours was the grimmest fate of all. Skilled to the point of genius, braver than Dick Tracy, filled with derring-do, we had been forced into the mould of Milquetoasts by an unkind destiny. A race weekend at Santa Barbara had just ended. As usual, we—John Tomerlin, Dave Watson, Ray Destabelle and I—had watched, timidly, from behind the snow fencing. Just like spectators. And each time a car would flash past, singing its derisive song, we would die most horribly, little by little, lap by lap. Until at last, weak from the sorrow only hobbled champions feel, we left. Before the Main Event.

And now we sat, the wives asleep, the suds luke-warm, a lachrymose quartet indeed. There seemed to be no answer. We had tried, as others had before us, to convert our family cars to combat work. Dave, a writer and photographer, had been the first. In the halcyon days (when everyone drove TCs and hated one another) he had entered his Morris Minor V8-60 in the lists. It had run well, but not wisely, ending, in the midst of its second race, in a geyser of scrap metal as spectacular as it was ruinous. Undeterred, Dave had then purchased a brand new 4CV Renault, which he essayed to run in the sedan race at Bakersfield. Alas, the car's endurance did not equal Dave's courage: while fighting it out for last place with a sick Volkswagen, a rod pierced the Renault's engine block like a Watusi spear, and a fine battle was ended. Ray, an engineer, had made similar attempts in his Austin-Healey 100, with depressingly similar results. John, an advertising man, had, in those same halcyon days, given the sport his all. Plunging himself inextricably into debt in order to bring his Porsche 1500 Super Speedster up to Stock, he had lasted for seven events, at which time the engine seized, the transmission broke, the brakes disappeared, and the creditors began to call. I, with incredible courage and dedication, had braved both penury and the imminent collapse of a happy home to pit my Porsche 1500 Normal against a legion of fleeter foes. I recall that a commentator once remarked of a performance of mine that "Beaumont is going like he had the Bank of America after him!" Which was true enough: the Bank of America *was* after me. And, despite obvious displays of championship ability, I, along with my compatriots, was at last forced to withdraw from the Hunt. Tearing the proud plaques from our dashes, taming the wild and hungry hearts of our cars, hiding our battle dress away in dark closets, we faced reality. We faced facts. We faced bankruptcy.

Months passed, and we all tried, very hard, to make the transition from Hero Drivers to Disinterested Spectators. We argued that there were plenty of other, less financially catastrophic hobbies to pursue. Like philately, or grunion hunting, or floral arrangements. What was the use of racing, anyway? What did it prove? So you go fast in a car, does that cut any ice immortality-wise? Childish nonsense, that was what it was. Morbid pandering to a neurotic death-wish. Who cared? Who gave a damn?

We did. Only too keenly aware of the truth of Mr. Kimberly's axiom ("If you can't afford to race, you shouldn't race") we found, nonetheless, that our spirits were falling at a rate commensurate with the rise of our economic statuses. Our expressions became hang-dog. We tended to mope about the pits at the various courses, filling our nostrils with Castrol fume, listening like hi-fi addicts to the percussive symphony of Ferraris at peak revs, and snarling at spectators that we, too, were fast *pilotos* once and would be again, some day. Our evenings were devoted either to building model race cars or playing "Grand Prix." If anything, we were more involved with the sport than before. But it was all sham. We derived no more real satisfaction from these ersatz activities than a confirmed alcoholic who has been forced to turn to Pepsi-Cola for surcease.

The Santa Barbara event had thrown us, finally, into a state of depression so profound that a thoughtless word would have set us all to weeping like children.

"That lousy Jimmy .....," said John, referring to the winner of the Under 1500 cc Production race. "I spun him out at Palm Springs. I almost lapped him at Torrey. Didn't I?"

"Truly," said Dave, "you did."

"Yeah," John said, dabbing a tear away.

"I had a watch on the leading Healey," said Ray. "Six seconds slower than I turned in '55."

"Yeah."

"If they'd only let us out there—"

"Yeah."

We sat in silence another hour. Then one of us (I shan't cause needless embarrassment by naming him) crashed his

hand down on the table, made a strangled cry that sounded like "Eureka!" and began to roll about the floor, singing "Happy Days Are Here Again." We thought, of course, that the poor wretch had cracked under the pressure, but before we could make a move to restrain him, he said: "Gentlemen! I have the answer!"

"To what?" we inquired, suspiciously.

"To our problem," he said. "How idiotically simple! How stupid of us not to have thought of it before!"

"Easy, old boy."

"Yes," he responded, *"easy*. My friends, is it or is it not a fact that in this room may be found four of the fastest, smoothest, most fearsome drivers in the world?"

"A fact," we chorused, sadly.

"And is it not also a fact that, owing to a thankless, shortsighted government which will not subsidize its future champions, we have been lately denied our calling?"

"True, so true."

"Very well. Now we have found that it is not entirely feasible to race our own cars; and of course we are all too proud and sportsmanlike to accept the largesse of some wealthy entrepreneur—"

"Well," interrupted Ray, "I wouldn't go that far."

"Be still. The point I am attempting to make is this: Our worries are over. Now listen carefully." He lowered his voice to a conspiratorial whisper. "Instead of hanging separately, let us hang together. Let us pool our meagre resources and *build a Special.*"

And so, with those fateful words, the die was cast. It is true that, however talented and successful we may have been in our individual professions, we were mechanical simpletons to the man; but that seemed a detail. Dave and Ray knew the principle of the internal combustion engine, John had actually assisted in the removal of a Porsche motor, once, and I... Well, I possessed the sensitivity that would give us aesthetic as well as technical perfection. Instantly, the following morning, we met again and put the dream on paper. After a cursory tabulation of our funds, we decided that a Class H Special would be the best bet. Something simple, economical, easy to repair, inhumanly fast and at least as handsome as a Ferrari would do.

Important things coming first, we designed a crest forthwith — a rampant turtle on a field of yellow—established and named our racing team (Equipe Tortoise), and decided upon the color of our coveralls. Then we discussed the order in which we would drive. Then we constructed a striking pit-board in the shape of a turtle.

Then, these items out of the way, we began looking for a car.

Class H automatically brought Crosley to mind, but upon making a close scrutiny of the winning machines of this marque, however mutated, we found that they were either as expensive as a Pegaso Berlinette or as complicatd as an ICBM. Therefore, feeling that the Special should be practical above all else, we rejected Crosley and, after entertaining lovely dreams of Oscas, Stanguellinis, Morettis, Giaurs, etc., settled upon Panhard as our base. Did not Jean Pierre Kunstle go like Jack-the-Bear in such a Special? Had not Perry Peron and numerous others caught glory by the short hairs thus equipped?

The problem of a suitable body arose and was promptly slapped down when, taking a constitutional one day, Dave saw what turned out to be the very first new-style Devin shell. Struck insensible by the beauty of it, he crawled, choking, to my house and presently the quartet was gathered. We knew, at once, our immediate destiny. Rough and transparent, the shell nonetheless possessed a personality that transcended anything seen in class H to date. It was sleek, fierce, graceful, and the spitting image of a Monza Ferrari. When we visualized it in bright red paint, we began to breathe heavily; when we discovered that the price was under $300, we swooned. It was beyond our wildest imaginings. A Special, we had been led to believe, must of necessity be hideous. Yet here was a body quite the equal of the finest.

Some investigation revealed that the car could be purchased in one of two forms: complete and incomplete. That is, we could place an order with Mr. Devin, close our eyes, open them, and find a race car built to our specifications; or, for slightly less, we could build the thing ourselves. As our ignorance was matched only by our enthusiasm, we naturally chose the latter.

"That way," we reasoned, "it'll be *our* car. When it nips across the line for the checkered flag, by George, we'll know *we* were responsible!"

Estimating a total cash outlay of $2,000, and six weeks of actual labor, we scampered out to Devin's factory and returned with several hundred pounds of metal parts. These we dumped in a garage we'd rented, next to Bill Corey's workshop, and went back for the body-shell which, in our haste, we'd forgotten. Envious stares accompanied our passage. Little boys dropped their yo-yos. Already we began to feel a sense of pride and adventure.

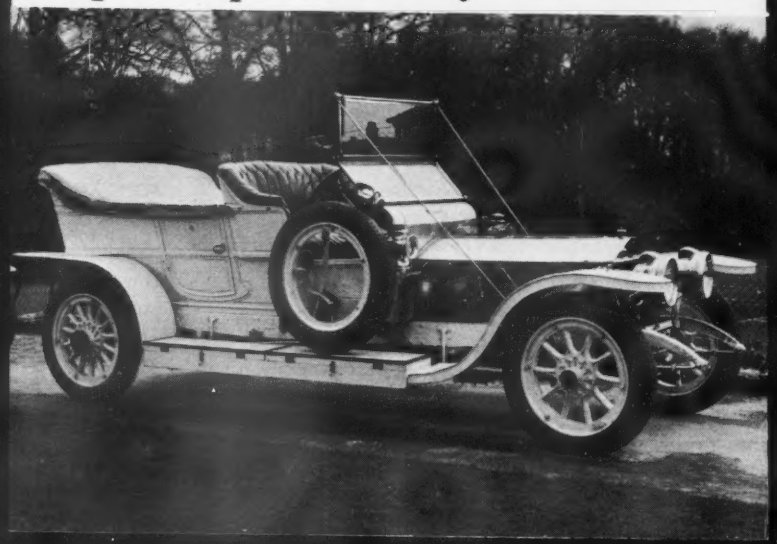
Unfortunately, the feeling was transitory. After drinking a toast to the success of the Equipe Tortoise, we found ourselves faced with the problem of transforming all of this debris into a racing car. And it did not seem quite so niggling a problem as it had before. In fact, for a moment, staring in silence at the mysterious mountain of dark metal, it seemed a large problem indeed. But, of course,

(Continued on page 80)

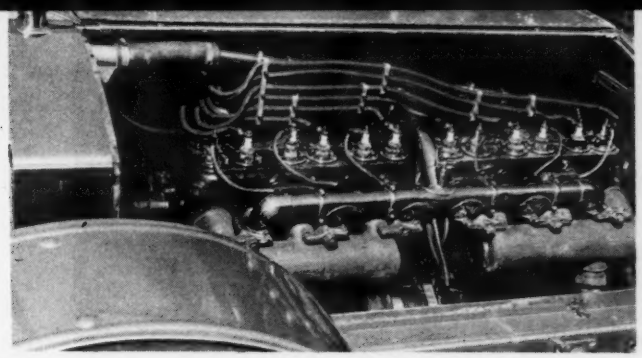
ROLLS-ROYCE

The Best Car in the World?

Sixty years of dedicated craftsmanship can provide only one answer.



ROLLS ROYCE



The classic Silver Ghost motor here in #750 chassis, built in 1908.

By David Scott-Moncrieff

▶ Laurence Pomeroy senior, creator of the immortal 30/98 Vauxhall, once described the Rolls-Royce as "A triumph of engineering over design." Said of the classic Rolls-Royce cars, those built up to the beginning of the Hitler War, this is pretty just comment. For if you were to take away the exquisite craftsmanship and the thousand-and-one refinements that make the Rolls-Royce what it is, you would be left with a basically not very interesting truck chassis, the sole merit of which would be that it would be impossible to wear it out.

Happily this hypothetical machine, the basic unrefined Rolls-Royce, does not exist. It has been submerged in fifty years of building, virtually regardless of cost, for ultimate refinement. And, post-war, the Rolls-Royce company has continued—and this was supremely difficult—to build the best car in the world within limits imposed by present-day economic conditions. This has not been accomplished without jettisoning many costly traditional features: the famous self-locking wire wheels, for example, standard since about 1908, replaced by ordinary "cheap" pressed-steel wheels secured by nuts. And the chassis is no longer held together by tapered bolts, each one hand-fitted into a hand-reamed hole. In fact, this so-called "commercialism" went so far that one senior member of the company, who had been with it since the beginning, resigned on the grounds that "The Company no longer builds motor-cars fit for gentlemen."

However, the results of this alliance between the traditionalists and the forward-looking commercialists have been very happy indeed. For the new "S" model not only gives one as much pleasure to drive as its illustrious forefathers, but it has enough go to satisfy any driver who is not in a really *big* hurry. And everything it does, of course, it does in absolute, total silence.

Like the partnership between the giant Marquis de Dion and the pint-size Monsieur Bouton it was an alliance between a wealthy, aristocratic patron and a plebian technician that produced the Rolls-Royce in the beginning. Henry Royce built electric cranes, in a small way, in Manchester, England. Early in the century he bought an automobile which was not only very unreliable, but the construction of which violated every principle of engineering ingrained in Royce. Like the Packard brothers, who bought a Winton about the same time, he decided that he could build a very much better car himself.

The result of this resolution was a splendid little car, beautifully engineered, as good or better than anything of its class and age. Soon it went into limited production in two, three and four-cylinder versions. Charles Rolls, the son of a wealthy nobleman, Lord Llangattock, already in business as an agent for Panhard et Levasseur, was so impressed with the car that he optioned the entire production, as Jellinek had with Daimler, a few years previously. In 1904 and 1905 Charles Rolls raced the 20 horse-power four-cylinder model, winning the Tourist Trophy in the latter year. (It seems odd to recall it now, watching a Silver Wraith town-car run softly down the boulevard, but the early R-R cars were as useful for competition as a Porsche is today.)

Legend to the contrary, the earliest Rolls-Royce did *not* have the famous squared-off radiator shell; they carried one that looked much like the then contemporary Panhard radiator. Late in 1904 they appeared with those of the traditional shape, basically unchanged today, 52 years later. The design was based on the Parthenon Temple at Athens in Greece. The company didn't bother to patent the design, and in 1913 it appeared on another car, the Sizaire-Berwick, duly protected by British patent! Berwick, who had left Rolls-Royce to join Sizaire, had simply taken the design along with him, and for more than 10 years Rolls-Royce had to pay a royalty to Sizaire-Berwick for the use of the Rolls-Royce radiator design! When the Sizaire-Berwick firm crashed in the late 1920's they bought it back!

The early R-R cars were good cars, but the company did not really hit the jack-pot until 1907 when the "Silver Ghost" appeared, and stayed in production for 19 years without major change—one of the four longest model runs in history the other three being the Model T Ford, the Jowett, and the Citroen.

A very large number of the *cognoscenti* swear that the "Silver Ghost" is the most *satisfying* car to drive that has ever been built. One wealthy acquaintance of mine who can afford, and does possess just about everything automotive engineering can offer, habitually drives his "Alpine Eagle" model "Silver Ghost" for sheer pleasure. I have tried to analyse this sensation, and this is as near as I can get to it:

(1) Being wafted along in absolute silence, like a motorless yacht with a following wind, while sitting in a seat

A Sizaire-Berwick wearing the "classic" Rolls radiator patented by Berwick.

A 1910 Silver Ghost at the start of the 1954 Anglo American Vintage Rally.

more comfortable than any modern arm-chair, high enough to see well over the heads of lesser folk.

(2) The mechanical perfection and positive action of all controls, including the steering.

(3) The smug satisfaction of knowing that every single part of the car, whether you can see it or not, is made, often quite unnecessarily, to tool-room standards of precision and machined to a show finish.

There is an indefinable something else, too—the pride of using an almost unique possession. As another writer has said, just the act of putting one's foot on the running-board of a fine old car makes one feel like a millionaire.

The "Silver Ghost" had a forerunner in a 30 horsepower, six-cylinder car of advanced design, virtually a 20 horsepower four-cylinder with two cylinders added. It is very doubtful indeed that a single example of this interesting model remains in the world.

Gone with the wind too is the fantastic "Legal Limit" 90° V-8 Rolls Royce. (Ed. note: See European Newsletter.) Rumor is that the Company did not think this as successful as it should have been, bought back every single car and broke them up.

The perfection, mechanically, of the "Silver Ghost" coupled with its splendid performance in the Royal Automobile Club 1,000 miles trial soon made it the best seller among European luxury cars, a position that had been held previously by the mighty Napier. Mercedes were building good sporting and racing cars at the time, but their luxury cars were not too good, and certainly could not compare with Rolls-Royce or Napier.

Some of the earliest "Silver Ghosts" had an overdrive in addition to the normal three speeds. This growled like a dog (being R-R, it was, of course, a very well-bred dog!) and enabled one to work the car up to something in excess of 70 miles per hour. In 1909 the overdrive ceased to be built and the stroke was lengthened from 114 mm. to 121 mm. It had hitherto been a "square" engine, decades before this became the very latest thing. The rear springing changed from semi-elliptic to cantilever in 1912 and in this form the "Silver Ghost" went on, with modifications, such as front-wheel brakes, up to 1925.

Charles Rolls was killed in a flying accident in 1910, but a very able team, led by Royce and Claude Johnson, carried on and in 1913 they built the high-compression, four-speed "Alpine Eagle" semi-sporting tourer, one of the most desirable collectors' pieces in the world.

During the Kaiser War, the firm built armored cars and airplane engines. Royce completed the design and development of a V-12 engine by Christmas 1918. He presented it to the Government, asking permission to go into production. Ostrich-like, the Government replied, "Don't you know the War is over? We don't want any more flying machines." During the next three years Royce cut the engine in half and used one block as an automobile engine. This engine was known as the "Goshawk" and is still referred to by that name by old hands at the Works. It appeared, after trials conducted in the strictest secrecy, in a chassis somewhat lighter than the "Ghost" chassis, in 1923, as the "20" Rolls-Royce.

There are still several hundred of these remarkable little cars (1923-1930) on the road today. They have one very curious feature. Although they're completely lacking in performance, with a top speed of barely 60 miles an hour, they are capable of putting up an astonishingly good average speed over long distances. The first dozen or so built, I know, because I had one, were relatively brisk performers. The company then decided that they were too fast for the back-wheel-only brakes and cast a new cylinder head, restricting the breathing. If you attempted to open up the ports you found yourself quickly in the water passages. Even after the introduction of four-wheel brakes in 1925 the use of the restricted head was continued.

The Rolls-Royce "20" with its "Swiss watch, jewelled in every hole" feeling and its economy of operation (over 20 miles to the gallon) is still a great favorite, even if it does move away from traffic lights with all the celerity of a horse and buggy. A perfect specimen of one of the last of them will still bring $1500.

The Phantom I appeared in 1925, and had it come out in 1914, the design still would have caused little comment as being new or revolutionary. No firm of manufacturers has ever made haste more slowly than Rolls-Royce. Still, the directors of the company were perfectly correct in their policy: Rolls-Royce customers wanted then, and still want, perfection, not novelty. Incidentally, there may still exist several unique Austrian-built P-I chassis. They resulted

J. C. Sword's 1923 Silver Ghost with Park Ward body.

from a law-suit brought by R-R against the old Austrian firm of Graf und Stift, for patent infringement. The Austrian courts found for the English firm and awarded very heavy damages. But Graf und Stift's funds were blocked in near-bankrupt Austria. So Rolls-Royce commissioned the Austrian company to build several P-I chassis from drawings which they supplied. Each chassis was completely hand-built in the Graf und Stift tool-room!

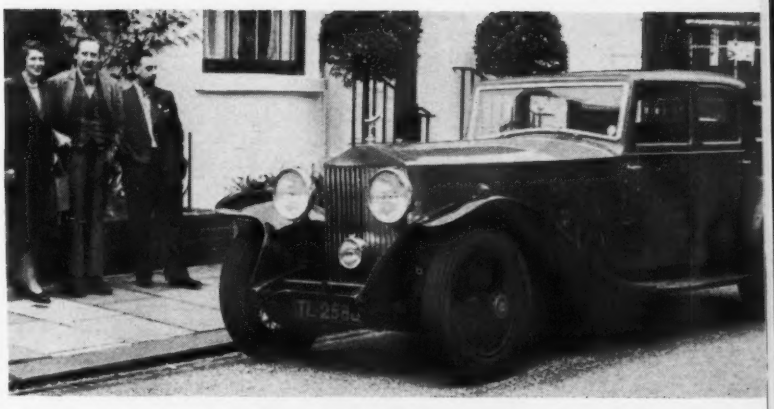
I never cared for the P-I; it used to frighten me too much. The top speed approached 80 miles an hour, the chassis was high and the coachwork often rather top-heavy. To say that it was a bit hairy in the higher speed ranges would be an understatement. It would have been as bad a man-killer as the "K" model Mercedes if it had not had infinitely better brakes.

There were a few exceptions, mostly among the last model P-Is, which had two plugs per cylinder, fitted with lovely open coachwork by Barker or Hooper. These behaved better, due to the lower and lighter bodies. One of them was fitted with a very light Weymann fabric sedan body, on a specially-modified chassis. The car was built for Philip Padden, a friend of Charles Rolls. It went like a scalded cat and cornered marvelously. It would be interesting to know how many cars were turned out with special features for friends of the Company. Certainly it was not an uncommon practice.

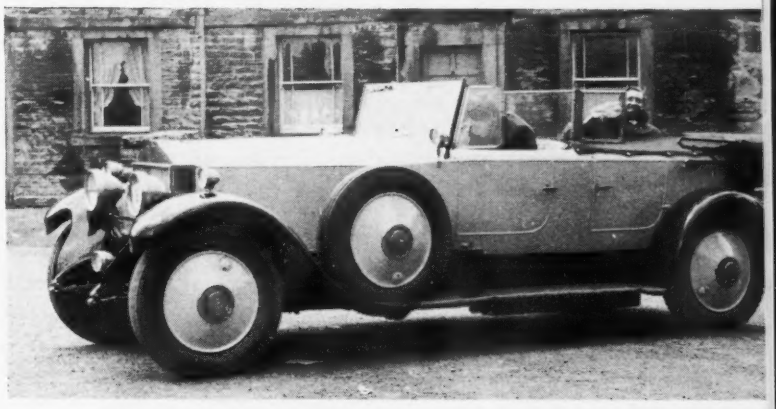
In 1930 two new models appeared, the "25" and the Phantom II. Also, there began to be built, to special order only, for approved customers, the car I think the best of all: the short chassis, hopped up Continental Phantom II. It's got everything any other Rolls-Royce ever had, plus performance, very reasonable road-holding and splendid brakes. Top speed of the Continental is 92 miles an hour, which it reaches very quickly with no sound but a well-bred sigh. The Board of Directors have decreed a maximum speed of 92 mph and that's it. There is little or nothing you can do to get more. A wealthy chum of mine got so exasperated that he vowed he would make his do 100. He spent $4,000 and finally had to button on a supercharger to get it. There are, however, a few individual cars built for old friends of the firm that will do the hundred, and a shade more, with complete silence and lack of fuss.

The "Continental P-II" is to my mind the most nearly

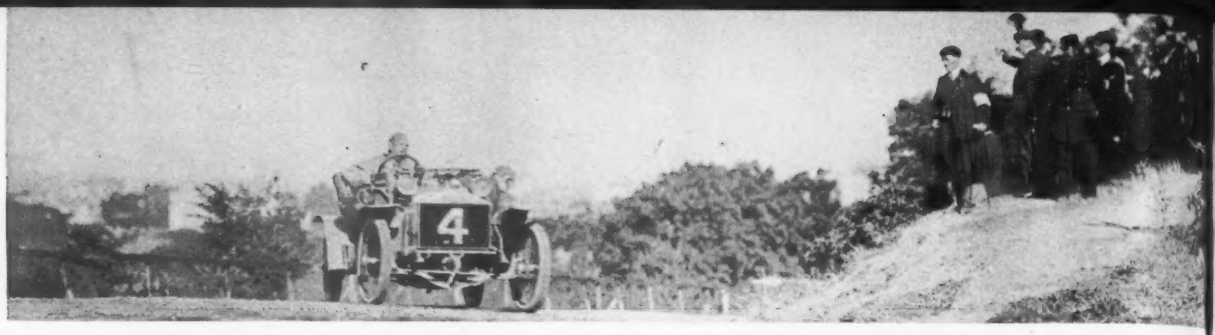
(Continued on page 93)



Above: One of the author's Continental Phantoms, his dearest love among Rollses. Below: Phantom I Park Ward tourer with immaculate black and yellow coachwork.



Below: A 1915 Silver Ghost the chassis of which carried an armored car body during World War I. The present body is of earlier vintage, 1911 or 1912.



Rolls comes over the summit in the first classic ever won by the "Best Car In The World." It was the start of a long partnership.

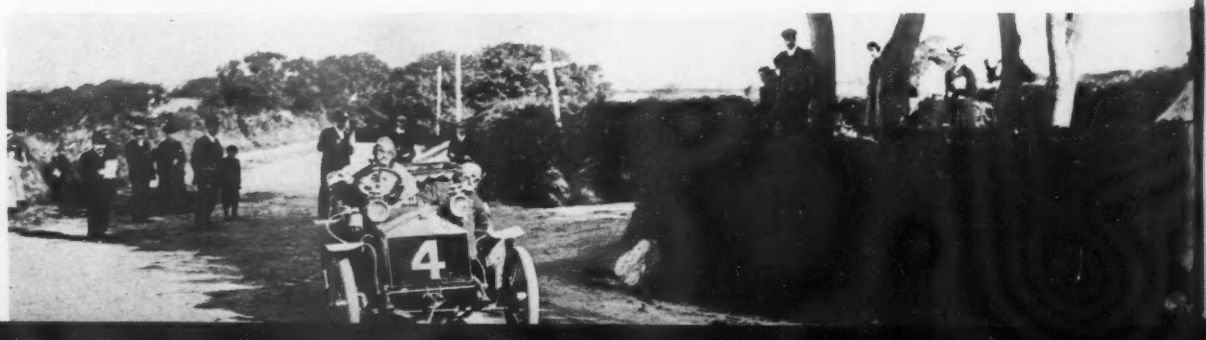
Below: The start of the '06 TT finds Sir Charles rolling d
the ramp at the beginning of his, and the cars, drive to f

ROYCES THAT RACED

by Dennis May

Above: the whispering, by comparison. Light Twenty crosses the line the winner in more ways than one. Wire wheels were optional.

The Hon. C. S. Rolls corners with verve on his winning ri
the 1906 Tourist Trophy. Car is the Light Twenty Rolls R



► To our generation, Rolls-Royces in the rough and tumble of competition are as hard to imagine as Vestal Virgins vieing for the Miss Rome title of whenever it was. Yet in its formative years, the firm not only raced and contested free-for-all trials, it also traded challenges with a well bred *élan*. Rolls-Royce Limited didn't put on those Best Car In The World airs by just a vote of self-esteem—they won the right to the slogan in the teeth of bitter opposition in races and tests of endurance.

"First" was the indispensable word in the story of the RR debut in speedwork. The even chosen was the first Tourist Trophy. The Hon. Charles Rolls's entries were the first to be filed. The TTs of Edwardian days featured interval starts, Targa Florio style, and C. S. Rolls rolled first. Finally, alackaday, his Light Twenty was the first car to quit, graunching to a halt only a few miles from the start with severe gearbox trouble.

All was not yet lost, however, because the factory's second string, another Light Twenty in care of a skillful whip called Percy Northey, was still in business. The course consisted of four laps of a 52-mile circuit in the Isle of Man, involving quadruple ascents and descents of Snaefel Mountain, and Northey was running third after one lap; heading him were John S. Napier's two-cylinder Arrol-Johnston and N. Littlejohn's Vinot, a French make. Northey's second lap average, 33.8 mph, beat everybody except Napier; on the third round he outsped the whole 42-car field at 34.1 mph; and the fate of the Tourist Trophy was narrowly decided in Napier's favor on lap four. Overall, the speed differential between the winning Arrol-Johnston and the next-up Rolls was a mere 0.3 mph, and Northey scored the incidental distinction of setting the highest nonstop average in the race.

As a sequel to this opening bout in the series that today is Britain's ranking event in the world sports car championship, Charles Stewart Rolls, having stooped to conquer (without conquering), stooped a little further to lodge a protest. His action, so uncharacteristic of the aloofness and hauteur symbolized by the intertwined Rs, was directed against the successful Arrol-Johnston. Contrary to the rules, Rolls pointed out, it had run part of the race in an unsilenced state, with its muffler dangling by its broken neck. Protest overruled.

In their shoes, anyone except C. S. Rolls and Henry Royce, perfectionists both, would have been pretty darned pleased with the outcome of the 1905 TT. The hypheneted marque had after all been on its feet less than a year, so there surely was no cause to go slitting wrists because they'd had to bow the knee to just one of the many longer established and more experienced makes ranged against them in Manxland. But Rolls and Royce, the former specially, didn't see it that way. Rolls, an adventurous and debonair spirit, had been racing assorted continental iron on the European mainland for years before providence gave him a nudge into Royce's orbit, and this background qualified him to judge automobiles shrewdly. He knew, with a conviction that was soul-deep, that any car his partner designed and built was The Best Car In The World; *ergo*, competition placements lower than first were not to be condoned.

True, there was that unfortunate incident of the gearbox failure in the TT to dispose of, and in fact it never was satisfactorily explained. *The Motor's* theory was that Rolls had caused the damage himself by neglecting to get into gear before coasting off the starting ramp, then trying to bully 'er in on the move. But Rolls denied this. Another theory, more acceptable to Rolls, was sabotage.

On the face of it, 33.7 mph, Northey's average for the full 208.5 miles of the inaugural TT, doesn't sound exactly like a Mach-busting pace, even allowing for the bad state of the Manx roads and the Snaefel obstacle, rising a respectable if not horrific 1350 feet above the start-finish area. But there were mitigating circumstances. Back then, *tourist* was the operative word in the Tourist Trophy formula, and on paper anyway you didn't have much latitude for monkeying with stock specifications. Full and effective silencing, as Rolls's disqualify-Napier plea underlined, was obligatory. Most important of all, there was a strict fuel consumption limit, same for everybody regardless of engine displacement — a minimum of 18.8 miles per U.S. gallon. The Automobile Club of Great Britain and Ireland, later to become the RAC, enforced this ration by simply issuing a standard gas dole to each competitor and leaving it up to him to make it last 208.5 miles. Some did, many didn't, but there were no prizes for doing a Jehu for three laps and runnig dry on the fourth.

There was a maximum weight limit, and here the spirit of the regulations took their worst beating. One car was rigged with a cardboard hood, another had cloth hubcaps, yet another sported "cord brakes", whatever this meant. More conservatively, the Rolls-Royces were fitted with lightened bodies and had their chassis "ventilated". High-point of skulduggery (to revert to mpg) was reached when the scrutineers discovered a car with an elaborate arrangement for replenishing the regular and visible fuel tank from a concealed auxiliary supply — after the official seals had been affixed.

The good performance of the 4-cylinder Light Twenty, like that of many later scions of the RR line, was owed to superior materials and manufacturing precision, rather than advanced or unorthodox design. The Light Twenty, like Hiawatha's arrow heads, was "smoothed and sharpened at the edges, hard and polished, keen and costly". Among the keener and costlier items were a frame and front axle made from nickel steel. Bore and stroke measurements of the Northey car — 95 x 127 mm — were the same as the two- and three-cylinder Royces of the period; its engine developed 19 bhp at 1000 rpm. C. S. Roll's machine was overbored to 100 millimeters, equal to 4 inches, and gave off 21 bhp at the same turnover. Otherwise the two cars were alike. Prophetically, both

(Continued on page 88)

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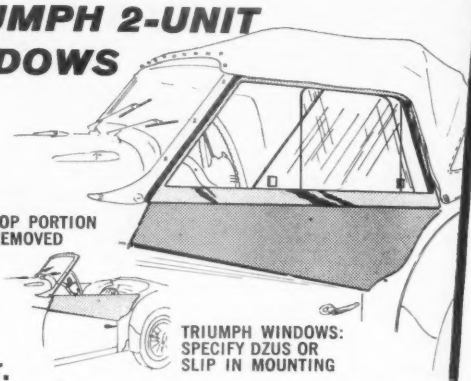

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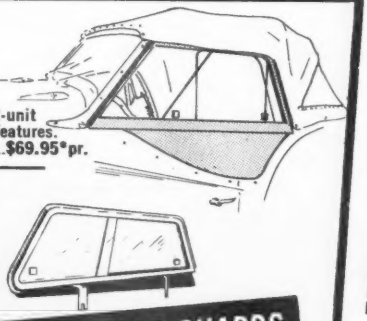

Similar in design and construction to the 2-unit window. Includes all the exclusive Bakers features. Enhances the appearance of any Triumph....**$69.95* pr.**

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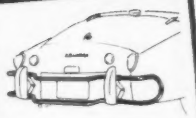

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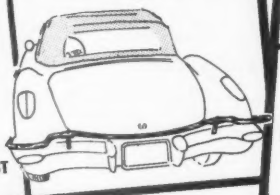

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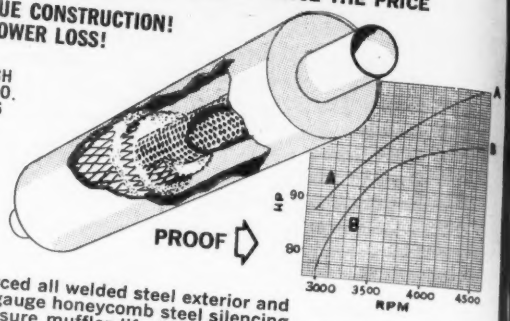

Reinforced all welded steel exterior and heavy gauge honeycomb steel silencing core assure muffler life three times as long as baffle-plate design. Heavy fiberglas packing creates pleasing low tone. No back pressure means more power, longer engine life, less vibration, lower floor heat.

PROOF—that Bakers Muffler (A) gives greater power at all engine speeds, compared to usual baffle-plate design (B).

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Fiat Conversion 600	15.95
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Triumph TR2-3-3A Rear	29.95
Front	11.75
Jaguar XK150, 3, 4, Mk 7, XK120	13.95
Jaguar XK120 sports —twin pipe	24.75
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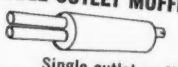
PRICES OF MUFFLERS NOT MENTIONED ON REQUEST

MGA & SPRITE DOUBLE OUTLET MUFFLER — **$15.50**



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Dauphine—2 outlet—**$15.50**
1 outlet **13.95**
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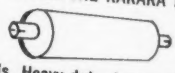

All models. Heavy duty, longer life. **$12.50**

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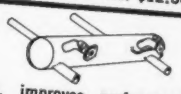

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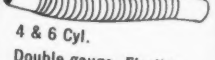

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Between 15 and 20 Karts started in each heat. First place in each go was worth 400 points. Winner earned 1200 points and huge silver punch bowl.

Above: The Go Kart Raceway is a complete plant, right down to the pylon turn markers and hay bales. This Kart course cost about $15,000.

Below: Richard Geer, first Kart National Champion, staves off Duffy Livingston in his bid for the

SHORT-FINISH

Nervous time on the starting grid. Kart racing is just for "fun", but it has its share of intense types. Here, various pit crews fuss over their drivers before start.

KART NATIONAL CHAMPIONSHIP

a slightly modified report by OCee Ritch

Los Angeles, July 15

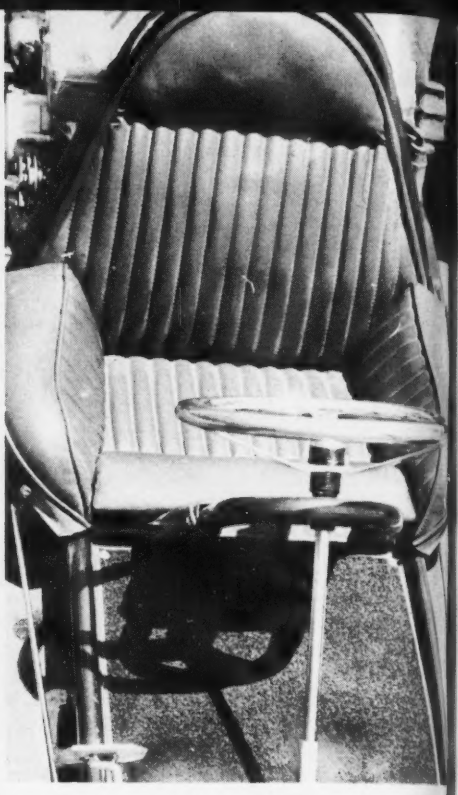
John Christy,
SPORTS CARS ILLUSTRATED
1 Park Ave.
New York 17, N. Y.
Dear John:

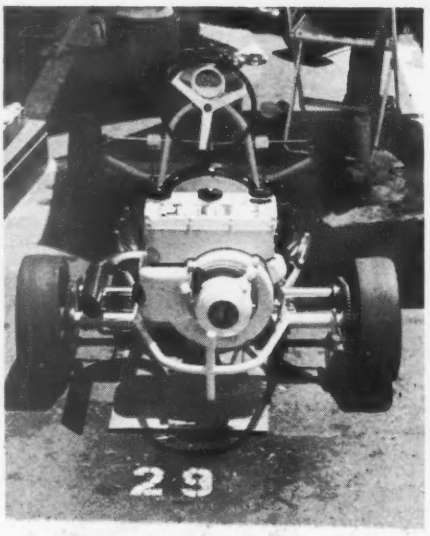
Well, when I got your telegram, PLEASE COVER GO KART NATIONAL CHAMPIONSHIP RACES, I can't say that I was overwhelmed with enthusiasm . . . mainly because I have been to Azusa once in my life and I was kinda hoping for the Bonneville assignment this year. Now, I realize that about one big event such as this is all the excitement that a writer can stand per year and this is why you spread the chores around, so, that's O.K. At least you said COVER and not ENTER, because, John, you haven't seen anything like what these krazy karters are turning on.

My initial mood was quickly dispelled when I arrived at the Go Kart track and found out that this was really a professional show. Or, maybe I should say AMATEUR, John, because the similarity to the way the Kart event was conducted and the typical SCCA or CSCC club races was overwhelming. You wouldn't believe it, but everything was right out of the book, from registration of entrants to the Victory Banquet. In fact, if it hadn't been for the vehicles themselves, you would have thought you were at Lime Rock or Riverside.

Flashing my Western Union wire from you, I signed my life away in return for a press pass that entitled me to wander anywhere on the course which is laid out in a five acre plot of thinly-disguised desert adjacent to the Go Kart Manufacturing Co. plant. There is a good $15,000 in-

Karts of all sizes and shapes showed up for the first National. This one was water cooled.





Above: Karts are fun, but they're not for types that bruise easily. One solution is padding, and more padding. Below: Most popular crew at meet. Faye Pierce and her all-girl equipe. They were not slowest either.

Above: Sensation of the meet was this Yamaha-powered Kart. It could go to 10,000 rpm without pain or strain—and sound like a Coventry Climax while doing it. Right: Still another variation on the Kart theme.—Mercury power.

vested here, John, and I am being conservative. In addition to the 4/10-mile paved 20-foot wide track itself, there is a big paved pit area, a snack-bar and timer's stand, acres of auto parking and the whole thing is properly fenced. First Cabin, all the way.

I mention these things only to point out how far the sport of operating the tiny vehicles at speed has come in the past two years and how grown-up the idea behind the whole thing is. With nearly 150 participants invited from all parts of the country, the GKCA National Championship really had an air of dignity.

That is, in everything but the driving position.

I know it's fun. It's exciting. There are all the thrills of road course racing. But, John, it's like George Bernard Shaw said while discussing another subject . . . "the position is so ridiculous." Hunkered up over the wheel with your knees and elbows akimbo, head hunched down to minimize wind resistance and "wedging" the little car through a turn like a bobsledder, you seem to be self-propelled. This takes a lot of the seriousness away from the whole affair and the Karters themselves proclaim that they are only out to have a good time.

I believed them too, until I watched the first practice session on Friday. Wow! These guys are competitive!

Like the sporty car things we are so used to, the pre-race activity in the pits was equally as fascinating as the track performances. Here, in miniature, were all the familiar acts and scenes: The Compleat Participants, with their umbrella, folding chairs, hamper of food and drink and tools neatly arranged around the "car" which was protected by a canvas cover. The karts were mostly brought to the races in station wagons or pickups and Service Cars were parked behind the pits in regular rows. Some, of course, came by trailer . . . and we had the Matching Ensemble where the kart, trailer and tow car are painted in harmony. The neatest "to scale" rig was a 500 Fiat convertible towing a kart trailer.

Trés Chic.

The karts themselves ran the gamut, as was the intent of the sponsoring club, and it is fair certain that a lot of ideas changed heads during the three-day blast. In addition to the more or less conventional karts reported on in other issues, a number of "specials" owing little or no allegiance to any maker were in evidence. Something I had never seen before, at least, was a *WATED COOLED* kart. Yep, powered by a Johnson outboard, 15-cubic-inch displacement, Lyle Fosgren of Everett, Washington is the progressive builder.

A number of Hovey Hawks, mounting the powerful 10 cu in 10hp Mercury commercial chain saw engines were in evidence and, lad, they sound wilder than a lot of Coventry Climaxes I've heard. Most of the entries stick with the original West Bend and McCulloch Class A mills but the Power Products lightweight and Homelite screamers are making inroads. All are highly modified and everybody, nearly, is using "fuel". As you know, anything that will burn can be used as a propellant and I have a suspicion that there is a little liquid rocket stuff in some of the cans. *(Continued on page 84)*

Why the man who owns one proudly recommends

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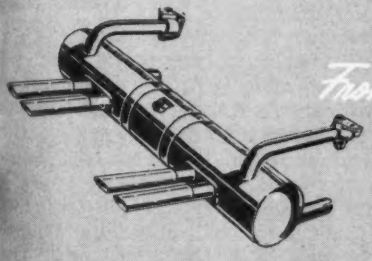
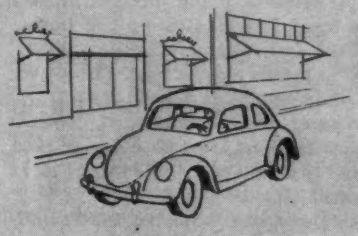
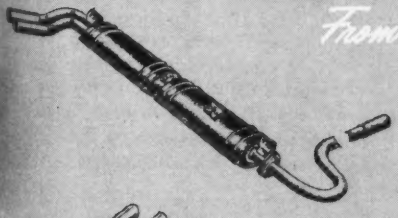
FREE-EXHAUST SYSTEMS

Everyone knows that Grand Prix Winners use and recommend ABARTH. But now read these excerpts from letters sent to us by non-racing ABARTH owners—from the man "next-door" who wants what you want in an exhaust system: greater fuel economy, easier passing, faster pick-up. They all agree that when it comes to fine Exhaust Systems—the *only* answer is ABARTH!

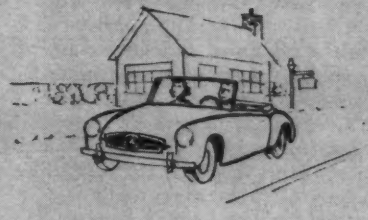


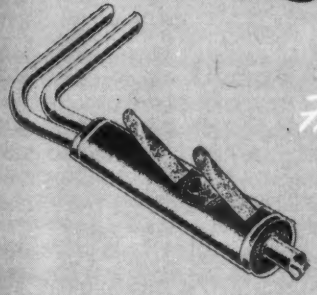
From **VW** owner, J. G. Tomkins, N. Y.—"Repeated checks on the same hill, starting up at 60 MPH, the speed at the crest has improved from 33 to 38 MPH. I still don't believe it, but it happens every time."



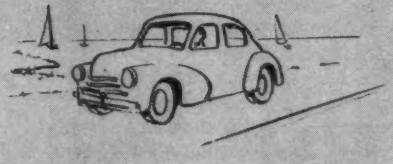


From **MERCEDES 190 SL** owner, Lt. Col. L. C. Coleman, Jr., Ret., Michigan—"Immediately after I installed the ABARTH System I could feel the improvement in performance. During a 1000 mile trip I checked the mileage on one or more tank-fulls and each time figured 30 MPG. 26-27 MPG was normal before I had installed the ABARTH System."





From **RENAULT** owner, Dr. J. R. Henning, Emporia, Va.—"Abarth muffler for my 4-CV worked so well I would like to have you send me one for my MGA."



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An Owner's Eye View Of The Herald

from page 41

remove a plug from each lower steering swivel, fit a nipple (having remembered to buy one first), and gun oil in. At 12,000 mile intervals the same goes for the steering box, water pump and back hubs. True, a single nipple, procurable for a penny or two, will do all these operations, but you do have the trouble, such as it is, of swapping it around between squirts.

In another department, viz, frost precautions, Triumph seem too modest to claim credit for a service you get for free. My Herald, anyway, came with full strength antifreeze in its cooling water, though the handbook implies you have to buy it. Again, according to all the reference sources I've consulted (which don't include the promised Repair Manual because it hadn't become available when this was written), there are *no* fuses in the electrical system. Beating the bushes behind the dash, I came up with one fuse. It's in the lighting circuit but I don't yet know which lamps it ties in with.

The water thermometer doesn't have degree calibrations, its scale being marked "C" for cold at full left, "N" for normal in the center, "H" for hot at right. If your Herald shows a steady reading about halfway between N and H under medium to hard driving conditions, don't worry. Mine does too. I had my Triumph dealer check it against a calibrated instrument and it turns out this needle position denotes 80 deg. C, which of course is about right.

Two more points about the instruments, which incidentally are by Jaeger, the top name for quality in their field:—1) The speedometer is almost uncannily steady, a valuable asset if you want to do a Wilder and take acceleration timings against a stopwatch. 2) The fuel contents gauge errs on the pessimistic side, so you still have quite a mileage to come when it says the tank is empty. Actually there is a reserve jigger in the system, but as neither the control itself (in the trunk) nor the instructions for locating and working it (under the hood) are visible from the driving seat, a stranger to the car can easily overlook its existence. The Owner's Manual doesn't mention it.

Gas capacity, at 8.4 U. S. gallons, is about average for small European cars, i.e., about averagely inadequate. I have a silver cup I'm going to present to the first filling station attendant who doesn't put the filler cap back on cockeyed; an elusive knack, this. But at least you can't lose the cap because it's hobbled by wire.

Engine starting is always instant and I've never used the choke yet, even momentarily. Another good feature Triumph leave the customer to discover for himself is the idle speed setter incorporated with the choke; initial movement of the control knob hastens the idle without richening the mixture, so you can get a desirably fastish tickover while closing the garage and ducking back for things you've forgotten. Warmup rate is very fast, so the heater comes into effective action without delay. Untypically, the 1959 British summer has been too hot to operate the heater in any way but experimentally, but dummy runs have sufficed to show this equipment on the Herald is really efficient, with an output that promises to be ample for colder winters than England's. The screenwash works extremely well too; it's the direct-control type that gives you one squirt for one push on the button, and *pro rata,* no more and no less.

A source of irritation during the first 2000 miles was a small symphony of squeaks from the suspension pivots, which, in line with Triumph's policy of cutting down on lubrication points, have nylon and rubber bushes. I cured this at first, but only temporarily, by watering the joints (rain would probably take care of it in normal British weather); but a more lasting remedy, which incidentally was gleaned from the Tourist Trophy Garage at Farnham, England, famous through its Mike Hawthorn associations, is to use brake fluid instead. This, with its potent penetrating properties, really gets inside the bushes and considerably lengthens the treatment intervals.

When it comes to the fundamentals of performance and roadability, it's hard to know where to start and where to leave off. At the first chance, *SCI* will doubtlessly run a full road test report on the Herald, and I've no wish to poach on this preserve. On the other hand, as readers may have some months to wait for the professional critique, till then maybe an amateur evaluation will be better than nothing.

On almost every count, the results vindicate Triumph's enterprise in adopting all-around independent springing. True, they're twenty years behind the German competition, and over a decade behind the French, in embracing this principle, but at least they've set a long overdue example to their technically timid British rivals.

Suspension and steering characteristics strike an outstandingly successful compromise between ideals that it's notoriously hard to reconcile, specially on a wheelbase as short as the Herald's 91½ inches. On the one hand, road holding and cornering qualities hit a standard that leaves the live-axle opposition for dead, or anyway dying, and compares very well with continental contemporaries combining a swing-axle back end with rear engine placement. On the opposite hand, under conditions least favorable to the Triumph, viz, traversing poor surfaces at low to medium speed, the ride is flatter and at least as comfortable as the best cart-sprung cars of similar weight and wheelbase, while at high speeds and on smoother pavement it is positively brilliant. Oversteer, normally regarded as in some degree inescapable with swing axles, particularly when light loading allows the back wheels to assume positive camber, seems impossible to provoke. Pitch and roll are absolutely minimal, and the steering, by rack and pinion, is totally devoid of vice. Without being heavy enough to be tiring on long drives, the tiller is perhaps hardly as light as you'd expect from gearing calling for 3.6 turns of the wheels from lock to lock; but this has to be related to the *extent* of the available lock, which is best expressed in terms of the car's phenomenal turning circle, namely 25 feet diameter. For a comparison, only one of the thirty makes reviewed in *SCI's* world roundup of small and "compact" cars last May undercut 30 feet.

The resulting manoeuverability in city traffic and tight parking situations has to be experienced to be appreciated, but it's important to realise that on full lock the drive thrust is acting almost at right angles to the plane of the front wheels; so if you don't watch out you can practically trip over your own tires. Also, in this steering attitude, one of the wheels slightly fouls the plastic curtaining that protects the engine room from road splash.

Straight line tracking at all speeds is excellent and there is no noticeable sensitivity to sidewinds. Positive as the steering feels, there is almost none of the kickback ordinarily associated with rack and pinion mechanisms. On close pitched bumps and potholes the small wheels set up a not too obtrusive timpany that can be heard rather than felt.

The best and sincerest compliment I can pay the Triumph, from the standpoint of general handling and amenability to male usage, is this: a longtime TR owner, I found myself mentally measuring the Herald for a TR3 engine before I'd put a hundred miles on the clock. Everything about its behaviour suggests that such a switch, giving around 107 bhp per laden ton, would exploit potentialities of a chassis design that are only halfway tapped at present, and certainly wouldn't overtax any facet in it. (This assumes, of course, the existing front/rear weight distribution could be approximately maintained).

Visibility and driving position — the latter subject in my own case to the "backsliding" mod described earlier—are superb. In only one direction, three-quarters rear, where the outlook is obstructed by the hardtop's unglazed area, is the outlook anything short of perfect. The dropped footwells give your feet and backside relative positions it would be hard to beat, eliminating that toes-on-a-level-with-your-breakfast feeling that is the penalty of many sports car and GT interiors. The seats themselves, although comfortable enough over moderate distances, are too short under the thighs, too shallow in the squabs, and don't give lateral support when cornering fast. The extra luggage hold *cum* occasional seat compartment is deceptive; the actual sitting-room is more spacious than most coupe annexes of its kind; so prospective adult passengers are liable to make the mistake of thinking there's ample space not only for their posteriors but also their heads. One guest of mine learnt his lesson painfully when, after crawling in there, he straightened up expansively and almost stunned himself on the low roof.

Most British test reports have criticised the noise level inside the car, except when all windows are kept shut, and this is a legitimate complaint. Sources of such noise are hard to analyse and separate but wind is one component, tire music another. Too, with the engine on the overrun at certain speeds, the transmission telegraphs a monotone through the rubber seated final drive unit.

The gear shift is light and fairly short in the throw, the synchromesh reasonably efficient. Bottom gear, at 19.45/1, is absurdly low, an insult to the capabilities of the engine. It could be three ratios higher without handicapping the car in any imaginable contingency, and this would also make it possible to close the second/third and third/top gaps salutarily; these, for most tastes and needs, are over-wide at 4.58 and 2.07 ratios respectively.

My Herald cruises comfortably at an indicated 65 mph, which, assuming the speedometer exaggerates to the same degree as those on cars issued by the makers for press test in England, means about 62 true mph. Highest recorded speed to date, on the flat, was 80 mph, approximating to a gospel 76 mph.

Carefully checked from delivery date to the 2400 miles mark, gas consumption has been as follows:—First 400 miles, 30 mpg (U.S.); next 600, 31 mpg; next 400, 28.4 mpg; next 500, 30.4; next 500, 32.3 mpg. The carb rampipes, incidentally, were fitted at the beginning of this last and best phase.

Road speeds equal to around 3500 rpm in the various gears weren't exceeded during the first thousand miles, whereafter the car has been driven hard most of the time and leniently practically never. Up to average in smoothness for a quantity produced four, the engine has no noticeable vibration period. As long as proper use is made of the idle speed setter mentioned earlier, it doesn't dither on its rubber mountings when fired up following overnight repose.

The honeymoon, after three months of Herald ownership, is over. The housekeeping phase, now solidly underway, is involving little loss of illusion, anyway on my side. With a mite of mutual toleration, this has the makings of a matrimonial marathon. *—gd & dm*

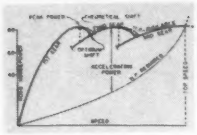
Coming Next Month

ROAD TEST
New Mercedes 220S

COMPETITION
Bonneville Nationals

FEATURES
Automobiles In Poland Today
Chrysler's Compact Car—The Valiant

TECHNICAL
Cooper-Climax



Gears

from page 54

gear will be all but useless for anything but starting, even with synchromesh. Furthermore, if we spread the other ratios evenly they are too wide for a small high-revving engine with a narrow torque range. The usual compromise is to use a relatively close ratio between 3rd and 4th (for passing on the road), with progressively wider steps in the lower gears — often with a really wide gap between 1st and 2nd.

The Jaguar gear ratios are very typical. They have three separate gearsets that will interchange in one basic box for all current models. Here are the ratios:

	Mark VIII, IX	*XK-150*	*3.4*
1st	3.38	3.38	2.97
2nd	1.98	1.86	1.74
3rd	1.37	1.28	1.21
4th	1.00	1.00	1.00

Note that all these gearsets have a relatively close ratio spread between 3rd and 4th, a bit wide ratio between 2nd and 3rd, and a very wide gap between 1st and 2nd. The heavy sedans, with lower-tuned engines and a narrower speed range on the road (up to about 105 mph), use the wider ratios — with a big fat 1st gear to get the weight off the line. The XK's have a much wider speed range on the road, but they are also heavy for a sports car — so must have a big first gear for acceptable standing-start acceleration. The ratio gaps here are intermediate. The gearing of the little 3.4 sedan is interesting. This car weighs very little more than the XK, uses the highly tuned 210 bhp engine, and will go 120 mph. The close-ratio racing gears from the type C competition model are used here. The bite off the line is pretty decent with the standard 3.77 axle, and maximum road speeds at 5750 rpm would be 70 mph in 2nd gear and 100 mph in 3rd.

Personally I don't like this gearing for the 3.4. If you have a choice of gearbox ratio sets for your car, I would suggest wider ratios for the road, with a big 1st gear for dig. I'd use the XK-150 gearset for the road in both the XK and the 3.4, but for racing either one I'd use the close-ratio 3.4 set.

Most racing circuits never require first gear after the start, but most gymkhanas seem to require little else. Since most boxes don't have synchro on first, it's necessary there to learn the touchy double-clutching technique, but I think your efforts will be well repaid in improved times. Remember, split seconds saved at low speeds knock more off your time than having a couple more HP at the top end on a straightaway. That goes for race tracks, too, for if you can dig from 25 to 45 mph a bit quicker out of the corner, you'll have 3-5 mph headstart on your competitor all the way down the straight, which probably is of more use than 30 extra horses at peak revs.

It goes double for the drag strip. About 90% of your attention should be concentrated on getting off the line and up to 40 or 50 mph in the least possible time. This is where you beat the other guy. This calls for a big first gear and then some smart driving technique to use it without leaving a smoke screen and most of your tread on the starting line. Small foreign cars can utilize overall gear ratios between 20 and 30:1 — and even our big Detroit stuff can use 12 to 14/1. A lot of Chevy V-8's are burning up the strips with 5.12 rear ends and standard 2.94/1 low gears in the trans. That's over 15/1.

Lots of gear — that's the answer for getting started.

SHIFT POINTS

If your tach is red-lined *this is your shift point*. You could probably get better times by going over the red line; but I can't advise it. On the other hand, if your engine is one that can be wound well beyond the actual peak of the power curve, a whole new world of performance possibilities open up . . .

Look at the graph in Fig. 4. We learned earlier that maximum performance is obtained when the engine is developing peak Hp; if the engine has to operate over a certain RPM range (depending on the gear ratio spread) the average HP over this range wants to be as high as possible. We get this by winding over the peak before we shift. In Fig. 4, if we shifted right at the peak in the intermediate gear (63 mph) the road HP would drop back from 80 to 56. On the other hand, if we wind on out in this lower gear the HP drops off gradually to 67 at 73 mph — at which point we can shift to high and pick up its curve at 67 hp. This is the "theoretical" shift point.

In practice Mother Nature fouls us up just a little. This is due to the effects of rotating inertia — or "flywheel effect" — of rotating parts of the drive line (flywheel, clutch, crankshaft, wheels, tires, etc.). It requires engine torque to accelerate these parts in rotation, and this torque is not available to accelerate the car in a straight line. The effect is as if you added *dead weight* — to the car. Furthermore, this rotating inertia increases radically in the lower gears; on a 3000-lb. car with an overall 1st gear ratio of 12:1 this rotating inertia is equivalent to about 1200 lbs. of dead weight. The effect of all this is to *lower* the optimum shift point, especially in the lower gears. The idea is to get up into the next higher gear very soon after you pass the peak of the power curve — and it's just as good as throwing a couple of hundred pounds of weight out the window.

This business is too complex to determine exact shift points for all cases here. The truly optimum shift point will depend on many factors — gear ratio spread, overall gear ratio, shape of the power curve, tire size, flywheel weight, etc. The serious competitor can pin-point his shift in each gear with an accelerometer (a device that indicates instantaneous acceleration). The optimum shift point is at the speed (mph) where the full-throttle acceleration, in say, 2nd gear has dropped off to equal its value at that same speed in 3rd gear. In high-performance cars, however, it is often difficult to read both the accelerometer and the speeds (or tach) simultaneously.

In the absence of this kind of test, here are some rough rules of thumb: With close ratio spreads, shift about 5% above the power curve peak in the lower gears, and 10% above in 3rd, red-lines permitting. For wide Detroit ratios (about 1.5:1) make that 10% above the peak in low, and close to 15% in 2nd. For instance, with an engine that peaks its HP at 5000 rpm, the shift in 1st and 2nd with a close-ratio box should be at 5250 rpm; in 3rd it would be 5000. With a wide-ratio 3-speeder you could come out of low at about 5500 and out of 2nd at 5750.

THE ENGINE AS A BRAKE

No discussion of gears and shifting would be complete without mention of the down-shifting technique to aid braking. I'd like to clear up a widespread misconception; the idea that engine *compression* is doing the braking. Nothing could be further from the truth. With the throttle closed, the compression and combustion pressures in the cylinders are so low they wouldn't stop a tricycle. What is actually stopping us is internal engine friction and pumping loss on the suction stroke. Think about it a second. Engine friction is almost as great when coasting as when pulling under load, and it shoots up rapidly—roughly as the *square* of the rpm. And don't forget that, with the throttle shut, the pistons are pulling against a vacuum of some 12 psi on the suction stroke. The two losses add up like crazy at high RPM. For example, a typical two-litre 6-cylinder with square stroke/bore ratio, turning 6000 rpm, would have a friction HP loss of around 75—and a pumping loss of another 11 hp. That's a total "overrun" braking effect at 6000 rpm of some 86 hp . . . and at 100 mph this would be equivalent to a retarding force of over 350 lbs. at the rear tires! This is what does the braking—not compression.

This engine braking is so large that on many sports-racing cars, where the disc brakes are more than ample, such as the Lotus, it is advisable to avoid it, at least at high revs. Why? Because the powerful brakes can, if front-rear distribution is correct, be right on the verge of locking up *all* the wheels. Any gratuitous braking from the engine that did lock them would be most unwelcome.

But in road type cars, the braking can generally be assisted to good effect by the reluctantly spinning engine. The main thing you have to watch when down-shifting is to not over-rev. Down-shift points should be carefully pre-determined on paper before you go racing. It's very simple: Just divide the red-line RPM by the transmission gear ratio. For instance, if your red line is at 6200 rpm and the ratio spread between, say, 3rd and 4th is 1.38:1, the down-shift point in 4th gear would be $6200/1.38 = 4500$ rpm. In other words, if RPM has dropped to 4500 in 4th, when you down-shift to 3rd the revs will rise to exactly 6200 rpm. Caution: Learn to blip with the throttle as you're down-shifting, to take some of the load off the synchromesh. Continual sloppy down-shifting can clobber the best boxes.

Now if you can figure how to go 500 rpm over the red line and keep everybody happy you've got it made! —*rh*

Lola

from page 35

far wrong in this car. Really fast circuitry was out of the question as it had rained the night before and the lower part of the circuit was marred by streaks of dried mud, including just those points where one wants to apply power coming out of a turn. The upper part of the course was clear though, so some appreciation could be gained of the car's fantastic cornering ability. On the banking the only limitation seemed to be the fact that the car bottomed at about 4700 revs or about 90 mph in high gear. We found that we could accelerate off the banking and be hitting 7000 rpm within a quarter of a mile. So effective was the car on the clear portions of the circuit that we and later Ross and Broadley could get around the circuit in fair Lotus and Elva times despite the poor condition of the track lower down.

Both Eric Broadley and Ross had said the car understeered, particularly at lower speeds. It did indeed, thanks to the rear end "tune" and the new, stiffer springs Broadley had brought along, but not to the extent claimed. This is a car that is meant to be driven fast and it should be so driven. At slow or even medium speeds it definitely tends to "push" the front wheels.

Because of warnings from Ross that a spin was a sudden thing and occurred without prior notice we were content at first to drive the car at the point where its feeling of understeering was wholly gone, going no further. Experience with other cars in which early understeer makes a sudden transition, sending the tail out viciously at the last moment made us a bit cautious. We needn't have worried. Broadley's latest springs seem to have cured the sudden breakaway. Toward the end of the day we found ourself whipping around the few clear corners and faster bends with the tail hung safely out in the breeze and without that "oops, Ooops, OOOPS!" feeling that all too many cars engender at such moments. We had the feeling that there was still quite a bit left before things came unstuck and that there would be warning enough before it happened. We also had the humble feeling that we could use much more practice if we were ever to get everything out of the car that the Broadley had designed into it.

One of the nicer aspects of the Lola was the absolute stability of the car at top speed. Some of the English lightweights have a tendency to "hunt" or feel unstable at any speed above 100 mph but not Lola. Where the car is pointed it goes, with no tendency to wander. Things do get a bit light at 7000 rpm but it's nothing one can't cope with.

There is a right tool for every job and Mr. Broadley's Lola seems to be the right one for racing Class G Modified. Anyone with $6000, give or take a few, and a burning desire to run G modified can find Al Ross at any Midwestern SCCA National. His is the blue car that just won. Eric Broadley can be found at 9 Napier Road, Bromley, Kent, England during the week. On weekends he too can be found at the nearest race meeting. His is the silver car that just won. —*jpc*

Ed Cole's Corvair

from page 30

COMBUSTION CHAMBER

Viewed in profile the chamber looks like a pure wedge-type, with inclined valves, but its roof is actually slightly crowned because of a small but definite angle between the intake and exhaust valves. This angle is in turn dependent on the valve gear arrangements. Following the VW tradition of mild tuning in relation to displacement, the valves are very small: 1.340-inch intake and 1.240-inch exhaust. They seat on inserts of cast nickel steel for the intake and cast chromium steel for the exhaust, and they're placed well to the sides of the combustion chamber to allow a bridge between the valves so broad that it can be supplied with its own direct finning and cooling air passage. Head finning above the chamber proper is concentrated almost exclusively around the exhaust valves and their guides.

Single valve springs, identical for all valves, close them while the familiar Chevy stamped rocker gear handles the opening. Of 1.57:1 ratio, the light rockers are pivoted from extensions of the nuts that hold the head down against the lower row of studs. Four long studs are spaced around each cylinder, those at the bottom of the engine being slightly closer together to allow them to help out with the rockers (top and bottom spacing was identical on the prototype engines). Tubular steel push rods function as on the V8's to carry oil to the rocker gear, and are surrounded by O-ring-sealed tubular housings which return oil to the crankcase.

All problems of changing clearance with expansion are sidestepped here by the use of hydraulic lifters as standard. Placed directly below the crank, the cast iron camshaft runs directly in the aluminum crankcase at four journals. The lifter bores are horizontal and very close together for each cylinder, to allow room for all the cams that had to be accommodated. Though all the intake cams are separately formed, it was found possible to save machining time by using only three very broad exhaust lobes which actuate two lifters each.

Valve timing is as follows:

	Intake	*Exhaust*
Opens	15° BTDC	59° BBDC
Closes	37° ABDC	13° ATDC
Duration	232°	252°
Overlap	28°	
Lift	0.360 in.	0.360 in.

LUBRICATION AND COOLING

A helical steel gear at the *flywheel* end of the crankshaft, just outboard of the No. 4 main, drives the camshaft through a cast aluminum gear. At the other end of the engine is a deep aluminum casting which adds rigidity to the crankcase. It carries the aft engine mount and crankshaft oil seal and houses the gear-type oil pump. This latter is driven by the bottom extension of the distributor drive shaft, which angles across the back of the engine and is driven by the crankshaft through a spiral gear set. Maximum oil pressure of 35 psi is reached at 2000 rpm and is limited to that figure by a spring-loaded relief valve.

After oil leaves the pump it passes through a full-flow oil filter, which will be bypassed only if the pressure drop through it exceeds 10 psi. If its temperature is higher than 160° F., it then flows through an oil cooler nestling at the left rear corner of the engine, relatively far from the cooling blower. Somewhat pessimistically some prototype engines had two long oil coolers placed along both sides of the blower. Two main oil galleries serve the lifters as well as the cam and crank bearings, the lubricant finally returning to the shallow pressed-steel four-quart oil pan.

Both centrifugal force and engine vacuum advance the Delco-Remy distributor, which fires 14-mm AC plugs of type 44-FF. At first glance the plugs look hard to reach but they're actually close to the generous openings in the cooling shroud, and should be more serviceable than those of most U.S. V-8's. The upper cooling shroud could be a very simple stamping because the ingenious fan arrangement worked out by Chevy engineers did away with the need for diffuser vanes. Placed horizontally on a ball-bearing mount atop the engine, the centrifugal blower is 11-inches in diameter and has 24 vanes. Spinning at 1.58 times engine speed it can deliver 1800 cubic feet per minute at 4000 crankshaft rpm, while taking up a minimum of space. Temperature is regulated by a ring within the blower intake which is raised and lowered at the command of a thermostatic bellows.

How to drive this flat-placed fan might, of course, have blocked progress without a little "imagineering" on the part of the G.M. research crew. An ordinary notched fan belt does the job by allowing itself to be bent over two transfer pulleys high at the back of the engine. The left-hand pulley is called upon to drive the generator at a rapid 2.3 times engine speed while the right-hand one is an adjustable ball-bearing-mounted idler. Between these pulleys protrudes the oil filler and the fuel pump, which is driven directly by a push rod and a conical cam on the crankshaft. Since it oscillates twice as fast as an ordinary fuel pump its stroke is proportionately shorter.

MANIFOLDING, IN AND OUT

Twin Rochester carburetors are featured on the Corvair engine, designed especially for this job. They're single-throat units, with a cluster of four radial tubes replacing the usual secondary or booster venturi within the main venturi. Chevy reports that this is "more effective with the relatively slow gas velocities developed with the dual carburetors and small displacement engine." They mount atop manifolds which were split on experimental engines but which are now cast integrally with the cylinder heads.

One of the mechanical disadvantages of a twin-carb layout on an opposed engine is minimized on the Corvair by placing the automatic choke at the air entry to the single air cleaner which feeds both carbs through rubber hoses, buttressed against collapse by coiled wire inserts. The cleaner itself is novel too, having a spongy polyurethane element soaked with oil.

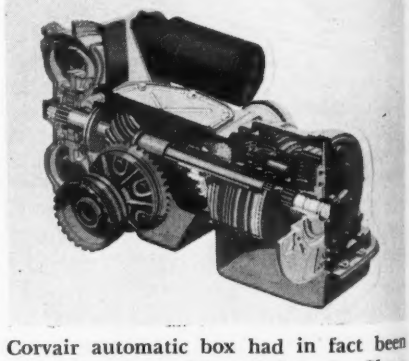
As cast in the head the exhaust ports are very short. They're extended downward away from the finned region by short steel pipes which are pressed into the ports to stay. Cast iron manifolds are clamped up against these stub pipes by three clamps each, and exhaust forward into pipes which curve around to the cylindrical reverse-flow muffler hung along the right side of the engine. A lot of muffling had to be and in fact was accomplished in a restricted space.

No horsepower figures have been announced as this is being written, but they're likely to be in the region of 85 bhp at 4600 rpm, naturally using regular gas. The emphasis is definitely on smooth running and reliability, enhanced by starkly rugged design and the extremely short stroke. As the engine is mounted it's sealed off from the Corvair interior both by the insulated firewall and by the shrouding of the air-cooling system, with the result that virtually all noise is left behind. The much-maligned "air-cooled sound" is evident only when decelerating from high engine speeds at closed throttle. The air cooling wasn't finalized until a lot of dyno time had been logged with a standard 1600 Porsche engine, so that's likely to be in good order.

As might be expected Zora Arkus-Duntov already has a special camshaft and modified cylinder heads ready for the Corvair, but it's unlikely that they'll be utilized until the model has proven itself commercially. Corvette-type versions of the car are an even longer way off.

AUTOMATIC TRANSMISSION

Interestingly and logically, it was originally intended to market the Corvair with automatic transmission only. Above all the car is intended to be a practical machine for transportation, especially in crowded urban areas, which means that it should be as easy and simple to operate as possible. Automatics, especially at GM are now developed to the point where their efficiency and simplicity are at acceptable levels for vehicles designed with economy in mind. The general arrangement of the



Corvair automatic box had in fact been laid out and tested long before the Chevy program began. Why is a standard shift also available now? Partly, it must be admitted, because performance and mileage didn't come quite up to expectations with the automatic, but overwhelmingly because Ford and Chrysler decided to get

into the act too, forcing GM to engage in radical cost-cutting to meet this unexpected competition.

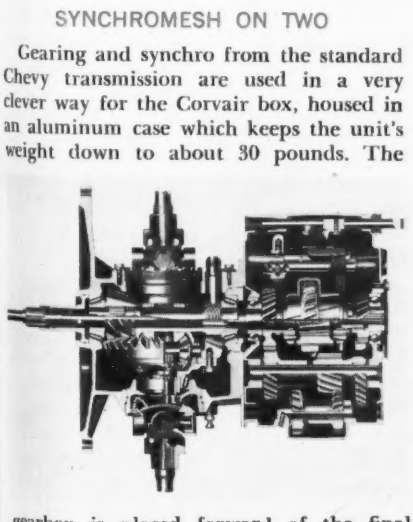
Driven by the crankshaft through a flexible plate is the three-element torque converter of ten-inch diameter giving a torque multiplication at stall of 2.6 to 1. Its input and output shafts are right on line with the hypoid pinion of the final drive, which is straddle-mounted above the differential; the drive goes forward from the engine and converter *through* the hollow or "quill" pinion shaft into the planetary gearing within its aluminum case. A compound planetary gear set is controlled by clutches and bands to supply a 1.82 to 1 reduction for low range and reverse, and eventually sends the drive back forward to the final drive pinion. It was found possible to make use of such parts as the front and rear oil pumps, governor and planetary gearing from the Chevy Powerglide and Turboglide boxes. Weight of the automatic installation is only 53 pounds more than that of the standard gearbox.

The same cast iron final drive casing and differential gearing is used for both gearboxes, and also houses the speedometer drive gearing which is machined on the pinion shaft. Traction is so outstandingly good (I couldn't drive an Impala over a soapy inclined plate that the Corvair didn't even know was there) that no limited-slip differential option is even contemplated. Final drive ratio is a standard 3.55 to 1, with 3.89 an option if the standard gearbox is used.

With the three-speed syncromesh box, a 9⅛-inch clutch is used, along standard Chevrolet lines except that no cushioning springs are fitted to the hub of the driven disc. Chevy engineers have designed the heavy-rimmed flywheel in such a way that it "damps out vibrations and radial deflections before they are transmitted to the drive line". So fundamental an approach is essential in this close-coupled system, which has no long propeller shaft to soak up random jolts.

SYNCHROMESH ON TWO

Gearing and synchro from the standard Chevy transmission are used in a very clever way for the Corvair box, housed in an aluminum case which keeps the unit's weight down to about 30 pounds. The



gearbox is placed forward of the final drive, and the internal gearing is placed just as it would be if the engine were in *front;* that is, the countershaft drive gear set and direct-drive clutch are in the front, and the second gear set with its clutch at the back, next to the hollow shaft driving the hypoid pinion. The drive from the clutch reaches the front of the transmission via a long, slim shaft that extends all the way through the pinion shaft and through a hollow mainshaft. Besides allowing the use of many available parts, this layout has the advantage, claimable by no other rear-engined car, of a direct, locked-up top gear.

To exploit the utilitarian aspects of the Corvair the countershaft drive gear ratio was changed, unfortunately to lower the second and first gear ratios as compared with the standard Chevy box. This is unfortunate from the over-the-road performance angle, since as geared the Corvair is hard pressed to do 50 in second — a ratio in which a car of its power and weight should be able to do some serious passing work. Using the handy floor shift lever with only moderate vigor a 0-60 time of 17.5 seconds was obtained, with two aboard. This relates as expected to a time of 18.4 seconds for an automatic-equipped car, which makes the shift from low to high at about 45 mph and can be kicked down to low at any speed under 40. The automatic's dashboard control lever is accessible and easy to operate.

WAS TUCKER RIGHT?

Before this cycle in the development of the American car is complete, somebody is bound to protest either in print or in private that GM has stolen poor Preston Tucker blind. It's true that the general layout of the Corvair resembles the one that Mr. Tucker chose for his batch of 26 Franklin-powered, Cord-geared "production cars", but Tucker didn't even have the good sense to leave the Franklins air-cooled. There is probably more engineering in the rear swing arm of the Corvair than there was in the entire Tucker car (with apologies to the few good men whose names were intertwined with that promotion). Enough of that line of thought.

Like rated power, price is also up in the air as this is written, but it's well known that the Big Three are aiming at "sticker prices" of under $2000 for their smaller cars, which infers a base price on the order of $1750. If they can do this, it will be a real accomplishment and a credit to Detroit's production know-how. It will also strike right at the heart of the imported car market in the U.S., which is, after all, what Detroit is counting on. If this mammoth gamble is to pay off, it *must* cut into the buyer pool created by the imports; it cannot draw deeply from the manufacturers' existing lines. More than ever, the future for the imported car will be the very specialized vehicle.

Does SCI like the Corvair? Yes, with the important reservations quoted above. It is a veritable technical orgy, and a promising basis for a long and useful development life. But most of all it personifies what we feel is important in the field of automotive safety: its fine steering and stable braking restore to the driver of an American car the kind of honest and precise control over his vehicle that he has had to do without for some three fast-moving decades. It has live nerves and quick reflexes that are worth more than all the seat belts and crash pads in the world. In the bargain, it's sparkling fun to drive.

—kl

Monzetta

from page 63

none of us would admit to the slightest misgiving. We drank several more cans of beer, picked up parts, peered at them, put them down, picked up others, and called it a day.

Next morning we went at the job in earnest. A discussion of race strategy lasted until noon, then we had a leisurely lunch and, around 3:00, rolled up our sleeves. The first discovery was not joyous. Either the frame did not fit the body or the body did not fit the frame. Ray was the first to laugh it off, explaining, out of his years of engineering experience, that obviously we would have to lengthen the body or shorten the frame. It seemed logical. So we took the frame and had it shortened five inches and narrowed four. That it came very close to fitting filled us with enormous satisfaction. Dave, by dint of his photographic experience, was elected head welder, and within no more than three months, we had most of the brackets, mounts, and other attaching parts fastened. What was lacking in professional polish was more than compensated for in bulk. Each weld was the size of a clenched fist, and this gave us great confidence.

An automotive writer named OCee Ritch dropped by at that point in the proceedings and, finding himself bemused by our operation, helpfully described what we were doing. For the technically minded, I shall quote him, briefly:

"The completed frame weighs less than 75 lbs., is sufficiently rigid to sustain the independent suspension favored by Panhard and accepts the stock rear end. The rear axle torsion bar unit from the Panhard roadster bolts right on. . . . The front end is a different story. A Fiat-style upper and lower transverse spring set-up provides independent front suspension. Sliding collar half-axles, with three U-joints per side, connect the transmission-differential combo to the wheels . . ."

All of which is doubtless true. At any rate, it was necessary for Dave to quit his job and work six to twelve hours every day to accomplish the above, and on the fourth month it must be admitted that tenacity had replaced enthusiasm. Between the golden hills of empty beer cans and the black hills of engine parts, we moved like damned souls doomed to work at a jig-saw puzzle for eternity.

One of the greatest disappointments came when we discovered that the engine compartment would not, could not accommodate the engine. It rose hideously four inches above the hood or bonnet line, and all of our piety or wit could erase an inch of it. The best answer, of course, was to have foreseen the difficulty in the first place. Now, to retain the smooth Ferrari line, we would have to tear everything down again and, to all intents and purposes, start from scratch. Which, of course, was unthinkable. Yet ruining the effect of our car by allowing great metal chunks to extrude was equally unthinkable. For one thing, everyone would know it wasn't a Ferrari. And we freely admitted — *I* did, anyway — that part of the fun would obtain from deceiving uninitiated spectators into the notion that we were racing a Ferrari.

There was, alas, nothing to be done, except junk the whole project — which we considered. So, abandoning our dream in favor of a lesser one, we tearfully cut the proper holes and told ourselves that it gave the machine a savage look.

Recompensing for this disaster by installing a first class racing steering wheel and two magnificently upholstered seats, we worked blindly for another three months. By now we were feeling like veteran mechanics, it goes without saying: modifying the cam, installing a special oil cooler, re-mounting the generator, etc. At last it began to look like a car. Not the beauty we'd imagined; perhaps, but, as John commented: "If it isn't going to be pretty, by Heaven it's going to be fast!" But, truth to tell, we weren't too sure of that, either.

Still, on we labored. And as the mountain of beer cans grew, the mountain of parts diminished; until, to our collective astonishment, we found one day that we had finished.

Dave, for his above-and-beyond-the-call endeavors, was given the privilege of starting the engine for the first time. A spectral silence fell upon us. Like soldiers who had fought a long and desperate war and found themselves unprepared for Armistice, we blinked foolishly at one another. Dave slid into the cockpits. He depressed the accelerator pedal. He reached out a trembling hand.

A cough. A grinding. A wheezing. Then:

It started! We shook our heads in disbelief. *It actually started!*

That was to be one of the last unalloyed moments of joy we ever felt regarding the car, though of course we didn't know it. We did insane dances, listened to the ear-shattering pierce of the exhaust, and forgot the months of labor.

First test was to be held on the old Hansen Dam course. It had been locked against the public, but we were shrewd customers. Lifting the chain and driving beneath it was the work of a moment. A couple of hours sufficed to set the carburetors. Then Dave took off for the first lap, experiencing a certain difficulty with the horizontal-H-pattern Panhard gear-change. John and Ray and I stood there, in the sun, watching the car flick around turn one and out of sight, and we were humble and silent.

So, as it happened, was the car, shortly thereafter. One lap had rendered first and second gears unusable, and the timing was off. Unconvinced, I took it for a spin, tried to shift into second, and returned with the gear-shift in my hands. It had broken loose completely. We couldn't do much else that day, so we left, basically pleased.

The following week saw modifications to the gear-box, switching it to the normal vertical-H pattern, and an unsuccessful search for a more substantial cover-plate. The one I'd cracked was of pot-metal, but Panhard apparently had not anticipated such displays of animal strength, for pot-metal was standard for the part. We tacked on some rubber and told ourselves to be gentle.

More experiences at Hansen Dam, correcting timing, getting the carburetors set, etc. Once we managed to complete an entire lap.

Then . . . our first race; at Santa Barbara! The gear-shift was still showing a rather distressing tendency to pop out of third — still the only workable gear — and we could not seem to get the beast to fire on both cylinders; but these were trifles. Had we not lapped Hansen as fast as the third place under-fifteen-hundred cc car in that venue's inaugural event? (No, we had not.) However, nothing daunted, we mailed in our entry and further alienated our wives by discussing race strategy until the small hours.

It was decided that Dave would drive on Saturday, in the qualifying event. Then on Sunday I would take it for half-distance and turn over either to John or Ray, who would flip a coin. We would not push it at all. We would simply cruise about, get to learn the undoubtedly peculiar handling characteristics of the front-drive Panhard, and otherwise go about things intelligently. Certainly we would not try to win a trophy, or (horrors!) *beat* anyone.

It is difficult to record with any real accuracy the glee we felt at technical inspection. Despite the junk sticking lewdly out of the hood, several people did inquire if it was a Ferrari. Crowds gathered. Conversation buzzed. Crosley drivers feigned disinterest. It was swell, even though we couldn't manage to fire up the engine.

Equally swell was Saturday at the course, before practice. We were neat as British waiters in our uniforms, and our car — which we had decided to call a "Monzetta" — was attracting a most gratifying amount of attention. Also, as things turned out, it was very nearly as loud as the 4.9 Ferraris and 3.0 Maseratis.

We watched the production cars line up for practice and fought our sudden terror by polishing he Monzetta's hood. Finally it was time, and Dave — the look of eagles in his eyes — hopped in. We pushed him to the grid. He started. He came around once. He came around twice. Then he did not come around.

The car had stopped running. We got it back to the pit and fiddled with it and got it working in time for the race. Again Dave took off. Two laps later he drifted in, silently, and we examined the situation and found nothing more serious than a blown engine. Specifically, a piston had disintegrated, covering the interior with a fine metallic dust.

Ray replaced the bonnet, slowly, as one would close a coffin lid, and said: "Well, we've got to get the bugs out, you know."

Many weeks and several hundred dollars later, we entered a race at Paramount Ranch. Paramount Ranch has been described as a "fun course" and it certainly is that, provided your notion of fun is going at incredible speed between rows of trees, under bridges, and around chasms, with one tiny slip consigning you without adieu to eternity. Happily, it was John's turn to start things off. Beginning from dead last position, he had managed to pick off three cars when, on lap three, swooping under the bridge, the gear lever

Monzetta

from preceding page

came off in his hand and he found himself hurtling toward a hill.

The Monzetta climbed the hill admirably, and rested from its promontory for the remainder of the race. Next day, *my* chance for glory was slightly diminished by a heavy rain and the loss of all gears save third, which had to be held in firmly. (We'd wired the plate back into position, welding being impossible.) One of the cylinders ceased firing after three rather fantastic one-handed laps and we retired, shaken, to the Coke stand.

"Got to get the bugs out," Dave said.

Next race was at Pomona. We had taken the transmission apart and worked over every minuscule portion of it and were sure, now, that all would be well.

Ray had starting honors this time, and our luck appeared to be on the upswing, for he completed practice and Saturday's race, placing fourth in class. (He claims also to have frightened Shelby into a dramatic spin into the three at turn six, but I can't quite see how that could have been, as the Monzetta was half a lap behind at the time.) On Sunday, however, the engine blew again. Sky-high.

It goes without saying, I trust, that the original budget had been somewhat overshot by now. It had, in fact, been doubled. But we were not defeated. Giving the next couple of races a miss, in order to become re-acquainted with our wives, we entered again at Pomona.

It was the scene of the Monzetta's sole achievement. Having crashed into a haybale during practice, Dave did not think that the car ought to be allowed to run; but we patched and pounded and persuaded, and he changed his mind. Starting from a poor position in the field, he amazed all of us — principally himself — by surging past most of our competitors on the first lap (accidentally shunting Pete Woods' inoffensive and pretty little Seidlitz Citroen 2CV Special in the process) and dogging the leader — Perry Peron — until the last lap, at which time he found an opening and went on to win the race. Our hosannas of joy were still echoing on Sunday when a perhaps over-jubilant Dave attempted to bluff a Lotus out of a turn. His lack of success was signal and he went into the hay like an ardent lover. Very little was left of the right side of the Monzetta, and, of course, the engine had decided to join the fun by ceasing forthwith to function.

At Palm Springs, I clung gamely to last place, finally ceding it because of further interior malaises. Which was as well, for, on the back straight, where it was possible to nudge 92 mph, rather frightening quantities of oil were being pumped into my face.

At Santa Barbara, ironically, the union —as well as the engine—dissolved. Getting off to a splendid start, on account of the curious firing of both cylinders simultaneously, Ray limped in after three laps; and we knew, without having to ask, what was wrong.

"Got to get the bugs—" John began, but it was no use. We'd never get the

bugs out, never, and even if we did, new ones would come to take their place. Our eyes were not entirely dry that day, standing by the crippled little Special, which had, after all, done its best. It hadn't died, really. A group of idiots had murdered it. And it was with no great pleasure that we finally admitted our crime. There was a feeling of relief, perhaps, but mostly sadness. It could have been so fine; and it *was* basically a good idea. But . . .

Ray bought the Monzetta from us over a year ago. Every race program contains his entry, but we never see the car. "It's being prepared," he tells us, and we nod and watch all the fine Devin Specials that followed our pioneering venture, all of them running well and fighting for the lead. And it makes us melancholy, but we take a certain small comfort in the knowledge that *someone* had to be first, *someone* had to blaze the trail so that others might travel safely.

And, who knows? Perhaps Ray will get it running right, eventually, and take it out, and we'll see it doing the job it was built to do. Stranger things have happened.

In the meantime, the rest of us have settled down. Dave has moved to Detroit. John is negotiating for a P-3 Alfa Romeo. And I have just bought a Porsche 550 Spyder, which is very fast indeed. It just won its first race awhile ago, and I'd be happy to take you for a ride in it, except that it is in the shop right now. An oil-seal broke and one of the stupid valves got bent, somehow. But never mind, I'll get it running in time for Santa Barbara, and then . . .

Little Le Mans

from page 61

the back entrance with an unreleaseable clutch. Moments later he restarted, wedged in a different gear, only to be black flagged for outside pushing and his unconventional pit stop.

For the last hour and a half, the surprisingly reliable Abarths pranced home happily, Richards having joined Cuomo and Erickson in the second-place one. In third spot, the John Christy-Walter Cronkhite Volvo was holding off the leading Saab GT by less than a lap. The latter, a private entry driven by Dillenberg and Iglehart, led the factory entries by a healthy 12 laps.

Saab GTs and 93Bs swept 4th through 8th places. Next came a startlingly fast NSU Prinz 30 which, like the Saabs, behaved out of all proportion to engine size.

Variety followed with Goggomobil T-700, Ford Anglia, Skoda and Lloyd leading the hastily repaired Abarth that had once led.

In all, 26 out of 34 starters finished. Though the percentage is down, the conditions were more arduous than ever, which only increases our respect for these mighty mites. A tough race for tough little cars.

—*sfw*

Go Kart National

from page 72

The exhaust fumes will make your eyes water.

Disc brakes, the familiar automotive type scaled down, are becoming popular and I noticed that quite a few of the karts had tachometers mounted in plain view of the driver. Some of the drivers also seem to be going in for comfort; heavily padded seats, rubber steering wheel grips and so on. One careful type even had an ash tray. John, I wish you could have seen the excitement when the *Yamaha* was unveiled. This must have been what it was like at Gilmore Stadium when the first Offy was fired up. Above all the noise in the pits; engines being warmed up, engines running at full bore to check ignition trouble, all the hubbub faded into the background when Ronald Lee brought this Japanese motorcycle mill to life. And, when he moved out to the track to qualify every individual not occupied with a car was lined up along the pit fence to observe.

Lee didn't disappoint, either. Although he didn't have the fastest time of the day (42.0 against 40.8) the homebuilt kart exhibited acceleration like you've never seen before. It was a first time out for the car and the driver but the Yamaha was impressive enough to make me think that a new era is dawning in the heretofore pennybank kart sport.

(The average investment in a kart, according to the official program, is around $500. This, John, includes about $100 worth of chrome plating.)

The way that the enthusiasts work on their karts in the pits is a ball, too. Almost any disability, including engine seizure, can be repaired with a few simple tools. So, it is not unusual to see a kart almost completely disassembled just a few minutes before a race. This was true at the Nationals and with 150 active disassemblers at work, it wasn't safe to walk down the pit aisles for fear of stepping on a spare piston, wheel bearings or mechanic's hand.

Seeing the mechanics at work on their tiny charges brought home another parallel between this burgeoning sport and the one we are more familiar with. Two years ago all the cars were owner-driven . . . or at least in the family. Today, in Karts, there is a high percentage of "professional" drivers . . . and, this will kill you, mechanics! No joke, John, the "patron" has appeared on the scene here, too.

Well, you couldn't be a *scuderia* owner much cheaper.

Girls, too, were much in evidence. Both as drivers and pit crew members, as well as spectators. This lent a lot of color and interest to the sport for those who hate mechanical things. One gal, Faye Pierson, had her own all-girl crew. Highly popular with the other photographers from Life, Look and so on. What they didn't know is that this chick is Mrs. Kart . . . or to be more to the point, the Lady Bug. . . . She's the wife of Bug Engineering prexy Tom

Pierson . . . and she races with the men, asking no quarter.

Wound up second overall in class A, too.

The qualifying concluded with no one having broken Bill Landefeld's 40.6 second trip that was established some time ago. The closest Bill himself could come in his Class C Villiers-powered Kustom Kart was 41.7 and Al McDonald's 40.8 was best of all classes. No new top speed record was set through the traps at the end of the 350 ft. straight either. (It stands at 51 mph) but observers remarked that more cars were near the 50 mph figure than ever before.

Drivers from out of state and from other areas were high in praise of the track, although getting used to herding the 100-lb monsters through turn 2 at the end of the chute where they had gotten up to 45 or 50 mph took some doing. Most of the contestants were parking-lot veterans and the 20 ft.-wide paving seemed awfully narrow at speed. The high bank, which was expected to cause the most trouble, bothered few but nearly everyone except the locals took a trip through the desert at the exit to turn 6.

Your air view, John, in the July issue of the magazine does not prepare the uninitiated for the sweep of this track and when the boys from the East and Midwest got a look at the miniature checkered pylons marking the turns, the timing traps and the shut-off markers, they flipped. In fact they were so impressed that they let the Azusa natives do all the winning.

By running a number of 15-lap qualifying heats, each class produced overall victors based on points. A win was worth 400 points; 2nd, 300; 3rd, 225 and so on. Between 15 and 20 karts competed in each race and the front finishers started in the foremost ranks in successive races.

There isn't room to describe the racing in detail, but, let me say this; all sports car events should be as well contested. In a couple of the heats, particularly, drivers who had suffered mechanical trouble in an earlier go fought their way fiercely to the front and came from behind in a stirring show. Sunday's crowd was really excited by the 3rd Class B main when Richard Geer staved off Go Kart manufacturer and sports car driver Duffy Livingstone by a whisker to save first and snaffle the grand silver punch bowl that was the Achievement Award to the high point man of the meet.

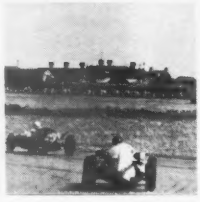
By virtue of winning all three of his heats, Geer copped 1200 points for a clean sweep.

Class A winner was Jimmy Yamane with two firsts and a second for 1100 points and Class C honors went to Al McDonald with 1000 markers.

All in all, John, it was a great weekend. And, I want to thank you for the assignment. I hope this qualifies me as SCI's Go Kart Expert and that I can handle all these events.

Please advise as soon as possible because I understand that Red Crise is strongly considering having Go Karts at Nassau and I want to make my reservation as soon as you send expense money.

Best Regards,
OCee



British Grand Prix

from page 48

had Jack in his sights when the rapid rate of tire wear forced him to call at the pits. Another instance of fouled up pit work occurred in the Aston-Martin pits when the oil tanks on Roy Salvadori's car were over-filled. The excess found its way onto his visor early in the race and slowed him up. Both Astons went well, but were far from sensational. The magneto drive on Shelby's packed up shortly before the race finished.

Before the main event of the day, a 17-lap, 51-mile, sports car race was held in which Graham Hill wiped up everybody with his Lotus. But as far as the GP was concerned, Ferrari was better off staying home, even with the labor trouble, for Brabham would have most probably trounced them as well. Ferrari has now had almost four weeks in which to prepare his Formula I cars for the German Grand Prix at Avus, and considerable testing has been done at Monza.

Tire wear was abnormally high at Aintree due in large part to the heavy rain which washed the track clean an hour before the start. After 35 laps, Brabham's

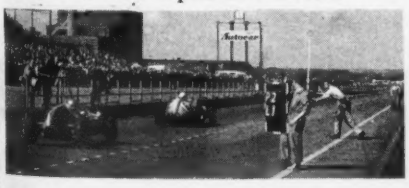
front right was going down at an alarming rate due to the nature of the circuit and he had a terrible time deciding what to do for at that point Moss was doing his nut in an attempt to catch and overtake Brabham. We can't say enough about the 2.5-liter Coventry Climax engine for it and the Cooper chassis are proving to be *the* combination this year. All four Climax-powered, 2.5-liter Coopers that started the race finished. Even Masten Gregory finished, something he hasn't been doing much of lately. Now that Stirling Moss has finally made up his mind to drive Rob Walker's 2.5 Cooper-Climax in the remaining Grande Epreuves, it will mean that Brabham will have to go faster than ever in order to hang on to his edge in the Championship race. The cries of "Bravo Digger!" have only just begun to be heard. —*ja*

RESULTS

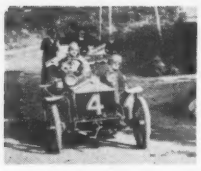
R.A.C. BRITISH GRAND PRIX,
Aintree England, July 18, 1959
Distance: 75 laps—225 miles

1. Jack Brabham (Cooper-Climax) 2 hr 30'11.6"—average of 89.88 mph. (previous race average at Aintree British GP in 1957—86.80 mph.)
2. Stirling Moss (BRM) 2 hr 30'33.8"—89.67 mph.
3. Bruce McLaren (Cooper-Climax) 2 hr 30'34.0"—89.66 mph.
4. Harry Schell (BRM) 2 hr 30'18.4"—74 laps.
5. Maurice Trintignant (Cooper-Climax) 2 hr 30'56.6"—74 laps.
6. Roy Salvadori (Aston-Martin) 2 hr 31'14.0"—74 laps.
7. Masten Gregory (Cooper-Climax)
8. Innes Ireland (Lotus-Climax)
9. Graham Hill (Lotus Climax)
10. C. Bristow (Formula II Cooper-Borgward) 2 hr 11'32.6"—83.14 mph.
11. H. C. Taylor (Formula II Cooper-Climax)
12. Peter Ashdown (Formula II Cooper-Climax)
13. Ivor Bueb (Formula II Cooper-Borgward)

Fastest lap: McLaren and Moss (Cooper-Climax and BRM) both with 1 min. 57.0 sec, 92.31 mph., new record.



Fastest Formula II car—C. Bristow (Cooper-Borgward) with 2 min. 05.8 sec., 85.85 mph.



The Royces That Raced

from page 69

featured overhead inlet and side exhaust valves, an arrangement that the firm was to abandon but reembrace many years later. The Silver Clouds and Wraiths of today, of course, in common with the Bentley cousins, have this top end layout.

In the transmission department too, Bentley practice of Georgian times was foreshadowed on these Edwardian Royces: they had four-speed boxes with direct drive on the third ratio, fourth being geared up and effectively an overdrive. Although maximum speed for the faster of the 1905 TT cars was only about 50 mph on the flat, his higher-than-high fourth speed enabled Rolls to hit seventy on the Snaefel descent. He never got as far as the damn mountain in the race itself but he'd demonstrated his three-score-and-ten capability during training.

The thing that set the Light Twenty right apart from the competition, however, was its supreme silence. Noise and power being synonymous in most peoples' minds half a century ago, the arrival of the spectral Royces at race headquarters in Douglas, Isle of Man, hadn't exactly spread panic among the devotees of rival makes. On the contrary, they jumped to the satisfactory conclusion that the parvenus from Manchester—where the original RR plant was located—wouldn't pull a robin off its eggs.

When, after the 1905 race was over, they were forced to face the unpalatable truth, these wellwishers changed their ground, whispering it around that the RR's ultra-high fourth ratio—the "sprinting gear", as the makers rather unwisely called it—left the car bankrupt of flexibility. The *canard* evidently reached the ears of the TT organizing committee, for the 1906 regulations introduced two qualifying tests expressly framed to put the finger on poor pulling power. The first was an observed hillclimb on a 16.66 percent gradient, the other a top-gear slow running test in which the cars were timed over a set distance at a maximum average of 12 mph. Both proved a pushover for the Rolls men.

Spared any Acts of God this time, Charles Royce turned the second Tourist Trophy into a rout, winning by better than twenty-six minutes from a French Berliet and raising the race record by over 5 mph. He could have done better too, if Claude Johnson, the firm's astute commercial brain, hadn't given him a series of go-slows as his lead mounted and multiplied. Or more probably, if it hadn't been for Johnson's dumbshow from the pits, Rolls would have ranked as a record breaking non-finisher, because at the end of the 161 mile course (the circuit had been altered and shortened since '05) he had just over a pint of gas left. It was Northey's turn to cop the annual Act of God: his car broke a spring and retired on the first lap.

A pattern of modesty, and always ready to render unto Royce the things that were Royce's, Rolls disowned the plaudits that were lavished on him after his TT victory. "As I had nothing to do but sit there and wait until the car got to the finish, the credit is obviously due to Mr. Royce, the designer and builder," he told reporters. But for one eighteen-mile stretch, as it afterwards transpired, his role hadn't been quite as sedentary as he told it. While sparring for an opening to take a fast Bianchi that had started several intervals before him, both lenses of his goggles were shattered by flying stones and his mechanic had to dispense with the customary handholds to wrap his arms protectively around his head and face.

The 1906 TT cars were basically unchanged from '05 but had cylinder bores of 101 millimeters and developed 22 horsepower. Also they were fitted with wire wheels in place of the old wood spoked artillery type. And thereby hangs a tale of financial stringency that smacks amusingly in the light of the company's subsequent *richesse*. Harold Nockolds, in his fine biography of the marque, *The Magic of a Name*, tells how Royce mentioned to Claude Johnson he'd have liked to specify wire wheels but didn't think the firm could afford them. To hell with the cost, said Johnson in a mood of bravado, and the wire wheels were accordingly fitted. The bill, at present exchange rates, came to around $120.

Indirectly and inadvertently, Northey's spring breakage in the 1906 TT may have been an Act of Rolls rather than a divine visitation. Prior to the TT, the Hon. Charles' ego had been stung in a tender spot by the establishment of a London to Monte Carlo record by an English motoring celebrity of the period, Charles Jarrott, driving a Crossley. The record, *qua* record, maybe wouldn't have bothered Rolls, but Jarrott's boast that Crossley's time was unbeatable by any ordinary touring car was hard to take. Rolls girded up his loins and beat it—by ninety seconds.

He and his navigator, Massac Buist, a well-known automotive scribe, elected to make the run in reverse, northwarding from Monte Carlo to London. Practically everything went wrong that could go wrong—except the Light Twenty, which ran faultlessly and incidentally was giving away 20 horsepower to the Crossley. Lashing rain turned Buist's route sheets and other papers into a lapfull of porridge, with the result the travelers lost their way and used up two hours tacking back to roads they recognized. Off course, they traversed some apalling surfaces that would have shaken a lesser car apart at the welds. Earlier, on the way down to Monte, they had taken the precaution of prealerting the keeper of a key grade crossing so he'd be awake at their estimated time of arrival in the middle of the night. But when they did show he was fast asleep, bribes notwithstanding, and kept right on snoring for ten priceless minutes against a barrage of horn music and cultured goddams.

Nevertheless, the Light Twenty's time to Boulogne, the embarkation port for the Channel crossing, was 3 hours 21 minutes inside Jarrott's figure for the same journey back to front; which was fine, except for the fact that Rolls had 3 hours 11 minutes to sweat it out on the waterfront before the next steamer steamed (Jarrott had timed his arrival at the corresponding English port so he didn't have to wait). On English soil at last, Rolls came to a misunderstanding with an ambiguous signpost and lost his bearings again; overruling his navigator, he blundered on into a labyrinth of Kentish lanes rather than backtrack and start afresh. Finally, after a solo drive equal in duration to 1.56 Le Mans races, albeit with a short respite while afloat, Rolls purred unobtrusively up to the ACGBI portals in London's West End, having taken 37 hours 28½ minutes for the whole trip and bested Jarrott by exactly a minute and a half.

The Monte Carlo record breaker was afterwards allocated to Percy Northey for the 1906 TT, and it was deduced, probably correctly, that the beating the suspension took during Roll's unrehearsed detour in outback France had weakened the spring that broke in the Isle of Man. Having scraped the barrel for 120 dollars worth of wire wheels, presumably Rolls-Royce were in no position to replace road springs as well.

Seven years were to pass before the second and last Rolls-Royce bid for the Monte Carlo record. By this time—1913—these exploits had acquired a bad smell, consensus of righteous opinion being that they were potentially dangerous. The temple of the Double R therefore declined to have any part in an attempt proposed by James Radley, a famous Rolls owner and amateur competition driver. Too, Britain's governing body of automobile sport, which had assumed a new respectability along with the Royal status con-

From "The Reporter," August 20, 1959:

THE COMPACT CAR

"Ford, General Motors and Chysler are reported prepared to spend 10 million dollars each on introducing their Falcon, Corvair and Valiant." —Printer's Ink

It's mighty expensive, it seems, to make clear
Which engine's in front and which sits in the rear.
An arrow says Ford that is weighted in front
Flies straight, while a back-weighted arrow just won't,
Implying that the Falcon is safer by far
Than the rear-powered Corvair, the Chevrolet car;
And Chrysler is pointing with scorn at the tail
Of the Volkswagen, Renault, and Fiat, which fail
(According to Chrysler) to properly steer,
Since their engines, alas, are encased in the rear;
While General Motors, in counterattack,
Claims a quieter ride with the boost in the back.
Whatever the outcome, the roads will be full
Of nice little engines that push cars or pull,
And no one need squander ten million to find
The relative merits of front or behind.

—sec

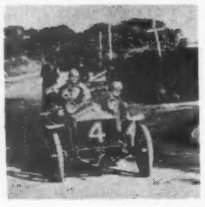
ferred on it in '07, refused to lend its offices to the deal. So although the timing of Radley's run was handled by irreproachable authorities, it was strictly unofficial.

Radley's car was a big 40/50 Silver Ghost, carrying a task force comprising the driver-entrant; a navigator in the person of Billy Rhodes-Moorhouse, who was soon to earn the first Victoria Cross awarded to a flyer in WW I, and to die doing it; an RR factory mechanic named Ward (how his employers came to let *him* enlist on Scuderia Subrosa is a mystery); and a fourth passenger, anonymous.

Unsanctified as it was, the Radley expedition seems to have been efficiently organised. Embarkation and disembarkation, and the associated formalities, went through at a gallop, with not a minute's unnecessary delay at the ports. The southbound run through France—Radley started from the London end—never deviated a parish from the planned itinerary. To cut down on refuelling time the car was fitted with an auxiliary tank located between the back seat passengers; this cistern was replenished at intervals—on the run, of course—from cans of gas piled into the tonneau. Hindered by the lurching and jauncing as Radley swished 'er around corners with a *brio* somewhat unbecoming to so majestic an automobile, Ward and his collaborator sometimes copped facefulls of essence during fillups, and a good deal of the stuff overspilled onto the carpets and upholstery rather than entering the tank. But these were minor inconveniences.

What really threatened to foil the whole enterprise was the Klaxonproof slumber of the crossing keepers at successive railroad intersections along the route. These fellows didn't merely nod at their posts, they were repeatedly found to be in bed and dead to the world. And when the travelers did eventually blast them into consciousness they'd flatly refuse to come out and operate. So Radley and company took matters into their own hands, poking a heavy tire lever into the padlock U-bolts and hauling them out by the roots. "Genius," as Dr. Johnson so rightly said, "is nothing more than knowing the use of tools."

The Ghost burbled into Monte Carlo just 26 hours 4 minutes after leaving the Automobile Association premises in Cov-



The Royces That Raced

from preceding page

entry Street, London, W.1. The public mood didn't permit Radley to claim this as a record, but it surely was a "record."

Americans had their first sight of the rectangular RR badge in the winter of 1906, when Charles Rolls visited New York with the Light Twenty that Northey had driven in that year's TT. Rolls raced this car on the Empire City track during his stay, winning a five-mile event for machines up to 25 horsepower. Back in Britain a few months later, he told the London correspondent of a New York newspaper what he thought of contemporary U.S. car design and quality, which wasn't much. Upshot of the interview was E. R. Thomas, designer and builder of the 60 hp Thomas Flyer, angrily challenged Rolls to race from New York to Chicago and back to New York.

"Rolls's reply," records Nockolds, "was to express willingness to take part in a competition that would test more important aspects than mere speed, namely reliability, fuel consumption, silence, flexibility and other qualities desired by intelligent motorists." In any case, Mr. Thomas having said the round trip contest must take place within thirty days of the challenge's issue, or not at all, acceptance was a physical impossibility for Rolls.

The following year an RR Twenty scored a noteworthy success in Florida during an Ormond Beach meeting, breaking the international five-mile record in the 60 hp class and winning the world touring car championship.

During the period Rolls-Royce were participating in competition, E. R. Thomas's challenge was I believe the only one the firm or its individual members received without jumping at it and, as the time limit had reduced this proposition to the academic level, it can fairly be discounted. Among the gages RR picked up almost before it had the floor was one tossed down in 1906 by a certain Captain H. H. P. Deasy, who had bees in his bellhousing on the subject of four cylinders *vs.* six. Four was the multiple beloved of Deasy, exemplified by a car called the Martini. Writing to *The Autocar,* the captain suggested the merits of the rival types should be put to a public test. Although Rolls-Royce had used their 20 hp four in the preceding year's TT, and were about to do so again, they'd recently added a 30 hp six to their repertoire, and probably foresaw the day when their whole resources would be concentrated on sixes.

Claude Johnson, who was a polished driver as well as a business man, therefore took it on himself, with his co-directors' approval, to take up the Deasy challenge. He went further and drew up a blueprint for the *kampf* that became famous as the Battle of the Cylinders. His Rolls and Deasy's Martini, cars of comparable power, would compete side by side in the upcoming Scottish Trials, a contest renowned

as a criterion of reliability. Additionally, they would travel *à deux* from London to the Scottish starting point, and subsequently back to London again, under Automobile Club observation. All-in mileage totalled 1660. The ACGBI were to be arbiters of hill-climbing powers, gas consumption, reliability, ease of gearchanging, and speed, while a London Stock Exchange committee was to adjudicate on silence and freedom from vibration.

What the Battle of the Cylinders triumphantly proved was that Deasy needed a couple more, Johnson winning with nearly 400 marks to spare. In the Trials themselves he didn't drop a single point, and made only one enforced stop in the whole five-day event—forty seconds out for a brake adjustment. The beaten Martini's engine, interestingly enough, was way oversquare—150 x 140 millimeters.

But in case the idea should get around that *all* fours were inferior in performance, RR products included, Rolls himself staged a hillclimbing demonstration with a Light Twenty on a well known urban acclivity in South London with a gradient of 17 percent. Piling nine 185 pound men aboard, he stopped and restarted with evident ease halfway up this hill.

Enamored as Rolls was of dering-do in all its forms (he'd been a racing cyclist in early youth, later became an enthusiastic baloonist, finally met his death while piloting a plane in 1910), it would be natural to assume it was he who set RR's wheels in the competition groove. In fact, though, the initial prompting came from an outside source, namely, one Arthur Briggs, who had bought the first Heavy Twenty ever built. That was early in 1905. When the ACGBI issued regulations for the first Tourist Trophy, Briggs urged Rolls to take advantage of the event as a forcing ground for development and an instrument of publicity if—as would undoubtedly happen—the marque acquitted itself well.

The original Rolls-Royce car was the progency of two associated but nonetheless separate firms, Royce Ltd. on the one hand, which handled the manufacturing side, and C. S. Rolls and Company on the other, responsible for commercial exploitation. Briggs effected the amalgamation whose fruit was Rolls-Royce Limited, and became one of its founder directors. Shortly afterwards, when public investment fell ominously short of the figure needed for essential expansion, and the firm's extinction in infancy was threatened, it was Briggs who came to the rescue with a check for £10,000. On the death of this lifesaver in 1919, RR's annual financial report was printed with a heavy black border around it.

Rolls, incidentally, continued to race other makes for some while after the birth of the Rolls-Royce, notably Wolseley. His company also carried on with its several flourishing dealerships, including New Orleans and Minerva. It was (quite unapropos) with a small Peugeot that, many years earlier, he had had the most ignominious motoring adventure of his career. Somehow, while cranking the Peugeot in the courtyard of a hotel at Gloucester, England, it had knocked him down and run slap over him, then continued into the road beyond and collided with a pony trap that happened to be passing.

Many and varied were the successes of the 7-liter Silver Ghost, patriarch of the spectral family that was to yield Phantoms and Wraiths by turn. In 1908, Johnson pitted a Ghost against the contemporary world record for nonstop reliability, held by Siddeley at 7089 miles. Driven by a team consisting of entrant Johnson, C. S. Rolls, Eric Platford and S. Macready, the big silken sidevalver knocked the Siddeley's figure for a row of ninepins, putting 15,000 miles on the dial, of which 14,371 were nonstop except for Sunday layoffs, before the marathon was voluntarily discontinued. The whole deal was conducted under RAC surveillance and it included, almost incidentally, successful participation in the season's annual Scottish Trials. The sole involuntary stop (outside of the 14,371 miles stretch) was no more than momentary—result of a fuel tap being shaken into the off position while traversing some fierce terrain in the Scottish event. When the whole thing was over, Johnson had the RAC officials dismantle the car to the last nut and bolt and replace any component that showed the minutest vestige of wear. Cost of the parts replaced, at present money values, was around six dollars.

In general, the marque was seldom represented in Brooklands races, for the obvious reason that Royces, the epitome of luxury and silence, were not normally fast cars. Once, in 1911, just for stately fun, the makers fitted a Silver Ghost with a lightweight touring body and a high gear ratio and timed it over a flying quarter mile on the English track. It turned 101 mph.

Nothing resembling a grand prix car, in the regular sense of the phrase, was ever built at the sign of the Double R; but if your automotive library includes a copy of Monkhouse's *Grand Prix Racing* (as it should) you'll see by the statistical section that a Rolls-Royce won the original Spanish Grand Prix in 1913. Winning driver was Don Carlos Salamanca, who averaged 54 miles per hour for the prescribed 192 miles, and another Rolls man, Eric Platford, placed third. The race was King Alfonso's idea; like his son after him, he was a fool for speed on wheels. For any thing aspiring to the title of Grand Prix, this race was something of a curiosity. Only touring cars qualified, hoods were sealed throughout, and no water replenishments were allowed. As the 64 mile circuit involved two ascents and descents per lap of the formidable Guadarrama Mountains, and the action took place in shade temperatures of 90 degrees (where there *was* any shade), the prohibition on topping up radiators wasn't funny.

But it didn't cause the RR element any anxiety, and Salamanca, the Spanish concessionaire for Mr. Royce's remarkable automobiles, finished a clear three minutes ahead of the second place car, a Lorraine Deitrich. Platford, at third, was nearly half an hour in front of the traveling dust-cloud enclosing the fourth finisher.

The mainspring of some great drivers is cooperative sense, team spirit; others are irked by shared responsibility and hit their highest bent as individuals. Such a one was James Radley, hero of the Monte Carlo "record" that wasn't a record because it couldn't be mentioned in God-fearing society. Following a moral victory for maker-sponsored Ghosts in triplicate in the 1913 Austrial Alpine Trial, the company passed up the '14 event, leaving it to Radley to run his privately owned 40/50 as a loner. As on the occasion of his Monte Carlo dash, however, they lent him the invaluable mechanic Ward.

In the face of opposition from bigger displacement cars than his own (factory teams from Benz and Austro Daimler, among other heavy artillery) Radley kept the RR pennant flying bravely for the first four days of the trial. On famous passes like the Pordoi, Rolle, Loibl and Falzarego he stood out as the star performer. Once, at a railroad crossing, their old *bête noire*, he and Ward were nearly beheaded when the keeper started lowering the pole when the Ghost was irrevocably committed to bisecting the tracks. Another time Radley missed the route, beat his way back to it after agonising delays, sidled into the tail of the crocodile, survived a series of waking nightmares in passing other cars on the brinks of precipices on his way up to his rightful place in the listed sequence.

Then, at Innsbruck, came the appointed day of rest. Rest for everybody, that is, except the mad Englishman, Radley. The talk at Innsbruck was of nothing but the Turracherhöhe, a new and horrific hill slated for the seventh day, which, the buzz had it, had never been climbed on wheels.

There wasn't any law against previewing the Turracherhöhe, just so you could get there and back in the one day that was available. Anyway, it was 250 miles away. Anyway, you couldn't use your competing car because all such cars were officially impounded during the rest day. It did just happen, though, that Radley had a friend, right there in Innsbruck, who had another Ghost, practically the duplicate of his own. The friend, the *Autocar's* reporter, Charles Freeston, was persuaded to unhand his Rolls. Leaving Ward behind, Radley lit out for the Turracherhöhe, traversing roads he'd never seen before.

A couple of hours before the trial was due underway again, Ward's anxiety was becoming pitiable. Half an hour short of zero time — still no sign of Radley — the mechanic was verging on panic. Fifteen minutes to go . . . and the wandering boy wandered in, practically invisible under his outer pelt of dust but otherwise none the worse.

Yes, he'd reconnoitred the Turracherhöhe. Yes, it was quite a piece of geology at that, but with the advantage of a few practice climbs he didn't think it was going to bother him. It didn't. Come the dreaded seventh day and, as Nockolds puts it: "Many failed on the steep stretch a hundred yards before the hill itself began; but the Rolls-Royce swept up with ease, arriving in Salzburg in its usual position at the head of the procession".

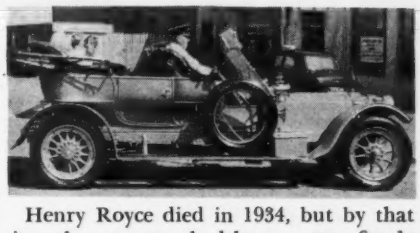
Frederick Henry Royce, Baronet, Officer of the Order of the British Empire, once described himself as "just a mechanic". By the same evaluation, James Radley was just a driver. But it was mechanics and drivers of the caliber of Royce and Radley who won Rolls-Royce the title of The Best Car In the World. And it was in competition they did it.

—*dm*

The Best Car In The World?

from page 67

perfect combination of a town car and a fast touring car ever built. It has only one disadvantage: it burns gasoline at about 9-11 miles to the gallon. With good fuel around 75 cents a gallon in Europe, not many Continental owners can afford to use for every-day driving the car that may be a greater joy to handle than anything else ever built.



Henry Royce died in 1934, but by that time the company had been cast so firmly in the mold of his mind, and that of Claude Johnson, that there was no danger of any fall-off in quality. Royce's death did bring one change: after due and deliberate consideration, it was decided to change the color of the enamel on the Rolls-Royce radiator badge from the traditional red to a mourning black, in perpetuity.

In 1935 the Company launched two new models. These were the "25-30" with a slightly increased engine capacity and the old, madly complicated but wonderfully efficient Rolls-Royce carburetor replaced by a Stromberg. The fuel consumption dropped from 21 miles per gallon to 16 and the performance was not greatly improved.

In 1931 Rolls-Royce had bought up Bentley Motors. It was widely believed at the time that this was done to put to death the 8-liter Bentley, which, had it been properly developed, would have been an infinitely better car than the Phantom II.

The Rolls-Royce company took the Goshawk based "25" engine and said to their experimental department, "Here you have an engine with a virtually indestructible bottom end. Build a dead silent sports car engine that can perform in no uncertain manner." This they did, and very well. The result was the 3½-liter Bentley, built by Rolls-Royce and put on the market in 1934.

A sufficiently well-heeled customer therefore had the choice, in 1935, of the new Phantom III Rolls-Royce, the 3½ and shortly afterward the 4½-liter Bentley, and the heavier, slower, slightly less economical "25-30" Rolls-Royce.

The Company was now ready to produce its ultimate effort, probably the most thoroughly refined automobile ever built: The Phantom III. Its like will certainly never be put into production again. Occasionally, even today a maharajah or a business tycoon orders one: the factory builds it for him at a cost that is said to be around $50,000—and at that R-R makes only a token profit!

The 12-cylinder 7½-liter P-III did everything, and more, that the P-II did, and did it with even more charm and grace.

The Best Car In The World?

from preceding page

The strange thing about driving a P-III is that although it is an *enormous* car, it gives the sensation of being only of medium size. Fuel consumption is around ten miles to the gallon, of course, and the maintenance of such perfect but complex machinery calls not only for a battery of special tools but know-how far in excess of average.

The earlier models of the P-III had, many years in advance of their time, hydraulic self-adjusting tappets. They worked marvellously — so long as the oil was kept scrupulously clean. Just before the Second World War put them out of production, P-III's were being built with an overdrive top gear. There are not many of them left, and those that are rarely come on the market, but for those who want the ultimate in a classic, as opposed to commercial, Rolls-Royce, this is it.

After the War the "commercial" Rolls-Royce and Bentley cars went into production, including the so-called "little" Silver Dawn Rolls-Royce. Both were developed along similar lines from the old "Goshawk" aircraft engine. Finally the new "S" model chassis came along, is now common to both cars and there is almost no difference, alas, between a modern Rolls-Royce and a Bentley, the radiator-shell excepted.

Two notable new cars have been built since the war: a special 8-cylinder state limousine for the Royal Family, cost undisclosed, and the "Continental" Bentley. This fantastically expensive 120 mile an hour automobile is the greatest joy to drive, or was until the really delightful gearbox was replaced by a Hydramatic shifting arrangement. As automatic transmissions go, this is a very good one, but it does seem that a man who spends the price of a house for an automobile might be allowed to decide for himself whether he wants a stick-shift or not.

Some day, it may be possible to write about the still-born Rolls-Royce automobiles: the models that were, for one reason or another, put aside. Down the years many, many prototypes of fascinating interest have been built. They have been tested, disguised as normal models, over thousands of miles of fast Continental roads, as has been R-R custom for decades. Then the decision has been taken not to put them into production, they have been dismantled and the bits and pieces sent as scrap-metal to the foundry, lest somehow one of them slip out intact and disgrace the family. Now and again, usually years later, word gets out: an 8-cylinder car was extensively tested during the 1930's, and in 1939 a beautiful little 2-liter was ready for production at the outbreak of war. There must have been many more, broken up for the furnaces by the strong-willed men of Crewe. It is hard to dispute their decisions, though, because after all, in good times and bad, peace and war, for nearly 60 years, nearly as long as the automobile has lived, men have called the Rolls-Royce "The Best Car In The World."

—dsm

German Grand Prix

from page 51

Climax engines in the Coopers were being overrevved in a big way and the BRM were down as much as five seconds in lap times. Dunlops had come to Berlin a week ahead of the race with Jo Bonnier and a BRM and put in considerable time testing their rubber. The results confirmed their suspicions that the regular Dunlop racing tire had more rubber than was actually necessary. Thus, 4 mm of tread was ground off on all of the tires issued to the three participating marques.

Ferrari again brought one "256" engined-car of slightly larger displacement than the others and this was driven mostly by Cliff Allison in practice, though it was not known whether he would start or not—the grid being limited to 15 cars. This particular Ferrari seemed to have considerably more power than the other team cars though up to now its reliability has not been proven. Finally on the last day of practice he set fastest training lap and caused considerable comment thereby. Dan Gurney went very well in his second Grand Prix, was fastest man on first day of training and was on the front row of the grid with Brooks.

Besides the Coopers, BRM's and Ferrari, there was a lone Cooper-Maserati entered as well as two Porsches, the Behra Formula II car and the works car, driven by Von Trips. Behra had left the Ferrari team after Reims, was planning on driving his own RSK sports car in the 1500 cc race Saturday afternoon and his own single seater the following day. Rain was falling when the sports cars were given the start flag in mid-afternoon, 50,000 people gathered around the circuit and in the infield opposite the banking. The first car to go out of control on the banked curve was Doery in his RSK; the car went into a lazy spin at the exit of the banking, finally connecting with the cement wall in front of the main grandstand. Doery climbed out unhurt but the car was badly battered. On the next lap around the most incredible accident of all happened. Carel de Beaufort, the Dutchman, lost control of his Spyder with the car spinning in a complete circle before it sailed over the top of the banking nose-first. The crowd gasped in amazement as a few seconds later the bent Porsche emerged from the paddock, being driven casually back into the race as if nothing untoward had happened. In a piece of luck that only comes once in a lifetime the Porsche had been cushioned in its fall by trees and heavy

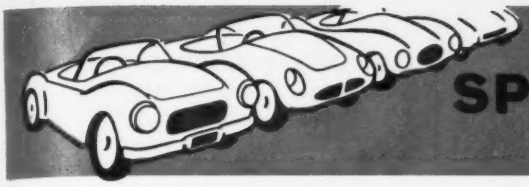
German Grand Prix

from preceding page

shrubs and had landed on all four wheels. De Beaufort tried the brakes and steering then decided that the car was still fit and rejoined the race, but as the organizers were giving him the black flag another Spyder was seen spinning out of control on the wet banking. It was Behra, in third place behind Trips and Bonnier in the works cars, and as he was one quarter of the way through, the tail of the car suddenly slid upwards and around, the car doing a complete circle before slamming viciously into a concrete block on top of the wall where it came to rest. Behra was ejected violently and thrown against a flag mast, the pole breaking under his weight. Jean Behra was dead before medical aid was able to reach him. Witness to all that transpired was Richard von Frankenberg who from the announcer's box was doing the race commentary. Von Frankenberg had escaped with his life three years ago when a special short wheelbase Porsche Spyder, the "Mickey Mouse" car, sailed over the banking. Porsche immediately withdrew their Formula-2 entry from the Grand Prix and this let Cliff Allison in with the extra Ferrari.

The Formula-1 GP was run in two heats, the hottest of all being the first one, thanks to Masten Gregory who was determined that the Coopers would not go down without a fight. Fortunately, Masten broke his engine before himself in the hot and heavy dice. Gurney said later that the Cooper stayed with him the entire distance down the straight, the Ferrari completely defenseless. Both Moss and Brabham in their respective Cooper-Climaxes dropped out early in the race with gearbox and engine trouble respectively. Allison's clutch packed up on the 256 Ferrari and despite feverish pit work by the mechanics he was not allowed to restart in the second heat. This second go-round proved to be a Ferrari demonstration as soon as McLaren's Cooper retired, for the young New Zealander had given Brooks a hard time in the early laps. Phil Hill went faster in the second heat than he did in the first as his rev counter had been telling him he was doing more revs than he actually was. But his second heat time still was not fast enough to beat Dan Gurney for second place.

BRM's were even slower than the Coopers; Hans Hermann had been hired by British Racing Partnership to drive the car that Moss had piloted at Reims and Aintree, and in the middle of the sec-



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German Grand Prix

from preceding page

ond heat, a brake locked in the approach to the hairpin and the car went into an almighty "Stürz" (German for accident) and threw Hermann out, allowing him to escape from an accident that practically destroyed the BRM. Bonnier's BRM had fuel pump trouble while Harry Schell pushed his car over the line after the clutch gave out. The only Cooper-Climax to finish was that of Trintignant, his honor the mayor. As soon as the Surbiton machines were out of the picture, Brooks, Hill and Gurney toured around to win, momentarily upsetting Brabham's winning streak. Brooks acquired 9 championship points at Berlin and is now within shouting distance of Brabham. Results at Lisbon, Monza and Sebring will decide the World Championship.

—ja

Dan Gurney

Results: 1959 German Grand Prix, Avus—Berlin, August 2, 1959

First Heat:

1. Tony Brooks (Ferrari) 1 hr., 3 min., 17 sec.—146.5 mph (248.7 kph).
2. Dan Gurney (Ferrari) 1 hr., 3 min., 18.9 sec.
3. Phil Hill (Ferrari)
4. Bruce McLaren (Cooper-Climax)
5. Harry Schell (BRM)
6. Maurice Trintignant (Cooper-Climax)
7. Joakim Bonnier (BRM)
8. Hans Hermann (BRM)
9. Ian Burgess (Cooper-Maserati)

Second Heat:

1. Tony Brooks (Ferrari) 1 hr., 6 min., 14.0 sec.—134.8 mph (216.8 kph)
2. Phil Hill (Ferrari) 1 hr., 6 min., 14.3 sec.
3. Dan Gurney (Ferrari)
4. Maurice Trintignant (Cooper-Climax)
5. Joakim Bonnier (BRM)
6. Ian Burgess (Cooper-Maserati)
7. Harry Schell (BRM)

Overall Results:

1. Tony Brooks (Ferrari) 2 hr., 9 min., 31.6 sec.—140.1 mph (225.36 kph)
2. Dan Gurney (Ferrari) 2 hr., 10 min., 33.5 sec.
3. Phil Hill (Ferrari) 2 hr., 10 min., 36.4 sec.
4. Maurice Trintignant (Cooper-Climax) 2 hr., 10 min., 1.9 sec. (1 lap behind)
5. Joakim Bonnier (BRM)
6. Ian Burgess (Cooper-Maserati)
7. Harry Schell (BRM)

Fastest Lap:

Brooks in 2 min., 4.5 sec., 149 mph (239.7 kph)

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